Installation Instructions

Allen-Bradley

PowerFlex 70 and 700 Packages for Fan and Pump Applications

Catalog Numbers 21V, 21W

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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This manual contains new and updated information.

New and Updated Information

This table contains the changes made to this revision.

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Updated replacement part numbers (style A) for some of these parts: disconnect switch, operator handle, and operator shaft.	119
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Updated AC input power terminal block specifications (style B)	57
Updated layout drawings to show new input power terminal block (style B)	86
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Updated replacement part numbers and horsepower ratings (style B) for some of these parts: disconnect switch, operator handle, operator shaft, bypass contactor, drive input contactor, drive output contactor, and overload relay.	123
Removed all style C packages (style C packages are no longer available for sale).	–
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The purpose of this manual is to provide basic installation and operation information for PowerFlex® 70 and 700 packages for fan and pump applications.

These additional manuals are required to properly install and operate the PowerFlex 70 and 700 packages for fan and pump applications:

- PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001
- PowerFlex 700 Adjustable Frequency AC Drives User Manual, publication 20B-UM001.

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About This Publication

This manual is intended for qualified personnel. You must be able to program and operate adjustable frequency AC drives. In addition, you must have an understanding of the parameter settings and functions.

What Is Not in This Manual

This manual is intended to provide basic installation and operation information. For this reason, the following topics have not been included in this manual:

- Specifications
- Troubleshooting
- Starting
- Programming and parameters

Refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for detailed information including specifications, troubleshooting, starting, programming, and parameters for the drives.

Manual Conventions

To help differentiate parameter names and liquid crystal display (LCD) text from other text, the following conventions are used:

- Parameter Names appear in [brackets].
  For example: [DC Bus Voltage].
- Display Text appears in “quotes.”
  For example: “Enabled.”

General Precautions

ATTENTION: This drive contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing, or repairing this assembly. Component damage can result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference A-B publication 8000-4.5, "Guarding Against Electrostatic Damage" or any other applicable ESD protection handbook.

ATTENTION: An incorrectly applied or installed drive can result in component damage or a reduction in product life. Wiring or application errors, such as undersizing the motor, incorrect or inadequate AC supply, or excessive ambient temperatures can result in malfunction of the system.

ATTENTION: Only qualified personnel familiar with adjustable frequency AC drives and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment damage.

ATTENTION: To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged before performing any work on the drive. Measure the voltage at the drive (Refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for test point locations). The voltage must be zero.

Catalog Number Explanation

The PowerFlex 70 and 700 packages for fan and pump applications catalog numbering scheme is shown below.

Position

1-3	4	5-7	8	9	10	11	12	13	14	15	16	17	18	19
21V	D	2P1	A	3	A	Y	N	A	E	C	0	B	N -	LR
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*	*o*

a

Drive	
Code	Type
21V	PowerFlex 70 Drive
21W	PowerFlex 700 Drive

b

Voltage Rating		
Code	Voltage	Ph.
X	208V AC	3
D	480V AC	3
E	600V AC	3

c1

ND Rating			
208V, 60Hz Input			
Code	Amps	Frame	kW (Hp)
4P2	4.8	B	0.75 (1.0)
6P8	7.8	B	1.5 (2.0)
9P6	11	B	2.2 (3.0)
015	17.5	C	4.0 (5.0)
022	25.3	D	5.5 (7.5)
028	32.2	D	7.5 (10)
042	43	D	11 (15)

c2

ND Rating			
480V, 60Hz Input			
Code	Amps	Frame	kW (Hp)
2P1 *	2.1	B	0.75 (1.0)
3P4 *	3.4	B	1.5 (2.0)
5P0 *	5.0	B	2.2 (3.0)
8P0 *	8.0	B	4.0 (5.0)
011 *	11	C	5.5 (7.5)
014 *	14	C	7.5 (10)
022 *	22	D	11 (15)
027 *	27	D	15 (20)
034 *	34	D	18.5 (25)
040 *	40	D	22 (30)
052 *	52	E	30 (40)
065 *	65	E	37 (50)
077 §	77	4	45 (60)
096 §	96	5	55 (75)
125 §	125	5	75 (100)
156 §	156	6	90 (125)
180 §	180	6	110 (150)
248 §	248	6	132 (200)

* PowerFlex 70 options only.
§ PowerFlex 700 options only.

c3

ND Rating			
600V, 60Hz Input			
Code	Amps	Frame	kW (Hp)
3P9 *	3.9	B	2.2 (3.0)
6P1 *	6.1	B	4.0 (5.0)
9P0 *	9.0	C	5.5 (7.5)
011 *	11	C	7.5 (10)
017 *	17	D	11 (15)
022 *	22	D	15 (20)
027 *	27	D	18.5 (25)
032 *	32	D	22 (30)
041 *	41	E	30 (40)
052 *	52	E	37 (50)
062 §	62	4	45 (60)
077 §	77	5	55 (75)
099 §	99	5	75 (100)
125 §	125	6	90 (125)
144 §	144	6	110 (150)

* PowerFlex 70 options only.
§ PowerFlex 700 options only.

d

Enclosure	
Code	Enclosure
A	IP 20, NEMA Type 1

e

HIM	
Code	Operator Interface
0	Blank Cover
2	Digital LCD
3	Full Numeric LCD
5	Prog. Only LCD

f

Documentation	
Code	Type
A	User Manual

g

Brake IGBT	
Code	w/Brake IGBT ❄
Y	Yes
N §	No

❄ Brake IGBT is standard on PowerFlex 70 Frames B, C, D and E, and optional on PowerFlex 700 Frames 4, 5 and 6.

§ PowerFlex 700 options only.

h

Internal Brake Resistor	
Code	w/Resistor
Y	Yes ∗
N	No

∗ Brake resistor only available for PowerFlex 70: 208V Frames B, C & D, 480V Frames B, C & D, 600V Frames B and C.

i

Emission	
Code	CE Filter
A	Yes
N ∗	No

∗ PowerFlex 70 600V ratings only.

j

Comm Slot	
Code	Version
B	BACnet
C	ControlNet (Coax)
D	DeviceNet
E	EtherNet/IP
H	RS-485 HVAC
I *	Interbus
L	LonWorks
P	PROFIBUS DP
Q	ControlNet (Fiber)
R *	Remote I/O
S	RS-485 DF1
N	None

∗ The comm slot option is no longer available for sale.

k

Control & I/O		
Code	Control	I/O Volts
A ∗	Standard	24V DC/AC
C ❄	Enhanced	24V DC

∗ PowerFlex 700 options only.
❄ PowerFlex 70 options only.

l

Feedback	
Code	Feedback
0	None

m

Package	
Code	Description
A	Main Input Disconnect
B	3 Contactor Full Feature Bypass with Disconnect
C *	3 Contactor Basic Bypass with Disconnect

∗ The style C package is no longer available for sale.

n

Reserved

o

Options		
Code	Description	
LR	Input Line Reactor	∗

∗ Only available with Package Code A and B drives 1.0…10 HP @ 208V, 1.0…25 Hp @ 480V and 3.0…25 HP @ 600V.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PowerFlex 70 Adjustable Frequency User Manual, publication 20A-UM001	Provides the basic information needed to install, start, and troubleshoot the PowerFlex 70 and 700 drives.
PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001	
PowerFlex 70 & 700 Adjustable Frequency AC Drive Reference Manual, publication PFLEX-RM001	Provides specification and operation details for the PowerFlex 70 and 700 drives.
PowerFlex 70 Enhanced Control and 700 Vector Control Reference Manual, publication PFLEX-RM004	
Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-AT003	Provides basic information for enclosure systems and environmental/location considerations (to help protect against environmental contaminants), and power and grounding considerations needed to properly install AC drives.
Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001	Provide the basic information needed to properly wire and ground pulse width modulated (PWM) AC drives.
Preventive Maintenance of Industrial Control and Drive System Equipment, publication DRIVES-TD001	Provides a checklist as a guide for preventive maintenance of industrial control and drive equipment.
Safety Guidelines for the Application, Installation and Maintenance of Solid State Control, publication SGI-1.1	Provides general guidelines for the application, installation, and maintenance of solid-state control with an emphasis on personnel safety.
A Global Reference Guide for Reading Schematic Diagrams, publication 100-2.10	Provides a simple cross-reference of common schematic/ wiring diagram symbols used throughout various parts of the world.
Guarding Against Electrostatic Damage, publications 8000-4.5	Provides an overview of the causes of electrostatic discharge (ESD), and how you can guard against the damage caused by ESD.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http:/www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Technical Support

For technical support contact information, see Rockwell Automation Support on the back cover.

Main Input Disconnect Package (style A)

This chapter describes the features and operation for the main input disconnect package (style A).

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Hardware Overview

The main input disconnect package (style A) combines an adjustable frequency AC drive with a means for disconnecting input power within a single package. Input power is connected to the PowerFlex drive through a door interlocked fuse disconnect switch.

Main Disconnect Switch (DS1)

An Allen-Bradley Bulletin 194R fused disconnect switch with lockable rotary mounted operator handle is provided. The disconnect switch is designed to meet disconnect switch requirements for branch circuit protection. The door-mounted handle accepts up to three padlocks.

Main Fuses (FU1...FU3)

ATTENTION: Most codes require that upstream branch circuit protection be provided to protect input power wiring. Install the fuses recommended in Table 1 on page 12. Do not exceed the fuse ratings. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Input line branch circuit protection fuses must be used to protect the input power lines. If input fuses are not provided with your drive, recommended fuse values are shown in Table 1 on page 12. The input fuse ratings listed in Table 1 on page 12 are applicable for one drive per branch circuit. Do not apply other loads to the fused circuit.

The recommended fuse type for all PowerFlex 70 and 700 packages for fan and pump applications is UL Class J, 600V.

Table 1 - Fuse Recommendations

Drive Rating			Fuse Rating
Input Voltage	**kW**	**Hp**	**Amps**
208V AC, 3-phase	0.75	1.0	10
	1.5	2.0	15
	2.2	3.0	20
	4.0	5.0	20
	5.5	7.5	35
	7.5	10	40
	11	15	80
480V AC, 3-phase	0.75	1.0	6.0
	1.5	2.0	10
	2.2	3.0	10
	4.0	5.0	15
	5.5	7.5	20
	7.5	10	20
	11	15	35
	15	20	35
	18.5	25	60
	22	30	70
	30	40	80
	37	50	100
	45	60	150
	55	75	175
	75	100	200
	90	125	250
	110	150	350
	132	200	400

Table 1 - Fuse Recommendations (Continued)

Drive Rating			Fuse Rating
Input Voltage	**kW**	**Hp**	**Amps**
600V AC, 3-phase	2.2	3.0	10
	4.0	5.0	15
	5.5	7.5	20
	7.5	10	20
	11	15	35
	15	20	35
	18.5	25	60
	22	30	70
	30	40	80
	37	50	100
	45	60	150
	55	75	175
	75	100	200
	90	125	250
	110	150	350

Electrical Installation

Input Power Wiring

Refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about input power wiring recommendations and selection.

ATTENTION: Protect the contents of the options cabinet from metal chips and other debris while making the conduit openings. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

ATTENTION: Do not route signal and control wiring with power wiring in the same conduit. This can cause interference with drive operation. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Follow these steps to connect AC input power to the drive package.

1. Select the proper wire size according to NEC and all applicable local codes and standards. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. Power terminal block specifications are listed in Table 2 on page 14.

2. Connect the three-phase AC input power leads (three-wire VAC) to the appropriate terminals. Connect the AC input power leads to terminals L1, L2, and L3 on the fused disconnect switch.
3. Tighten the AC input terminal power terminals to the proper torque according to drive type as shown in Table 2 on page 14.

Table 2 - AC Input Power Terminal Block Specifications

Voltage Rating	kW	Hp	Maximum Wire Size(1) mm^2 (AWG)	Minimum Wire Size mm^2 (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…3.7	1…5	10.0 (8)	2.5 (14)	1.6 (14)
	5.5…7.5	7.5…10	25 (4)	2.5 (14)	2.8 (25)
	11	15	50 (1)	4.0 (12)	4.0 (35.4)
480V AC	0.75…7.5	1…10	10.0 (8)	2.5 (14)	1.6 (14)
	11…18.5	15…25	25 (4)	2.5 (14)	2.8 (25)
	22…37	30…50	50 (1)	4.0 (12)	4.0 (35.4)
	45…75	60…100	150 (300 MCM)	16 (6)	22.5 (200)
	90…132	125…200	2 x 185 (350 MCM)	2 x 16 (6)	45.0 (398)
600V AC	0.75…7.5	1…10	10.0 (8)	2.5 (14)	1.6 (14)
	11…18.5	15…25	25 (4)	2.5 (14)	2.8 (25)
	22…37	30…50	50 (1)	4.0 (12)	4.0 (35.4)
	45…75	60…100	150 (300 MCM)	16 (6)	22.5 (200)
	90…110	125…150	2 x 185 (350 MCM)	2 x 16 (6)	45.0 (398)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

Output Power Wiring

Refer to the PowerFlex 70 Adjustable FrequencyAC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about output power wiring recommendations and selection.

ATTENTION: Unused wires in conduit must be grounded at both ends to avoid a possible shock hazard caused by induced voltages. Also, if a drive sharing a conduit is being serviced or installed, all drives using this conduit must be disabled to eliminate the possible shock hazard from cross-coupled motor leads. Failure to observe these precautions could result in bodily injury.

ATTENTION: Do not route signal and control wiring with power wiring in the same conduit. This can cause interference with drive operation. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Follow these steps to connect AC output power wiring from the drive to the motor.

1. Wire the three-phase AC output power motor leads by routing them according to the drive option type. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. Power terminal block specifications are listed in Table 3 on page 15.

   Do not route more than three sets of motor leads through a single conduit. This minimizes cross-talk that could reduce the effectiveness of noise reduction methods. If more than three drive/motor connections per conduit are required, shielded cable must be used. If possible, each conduit must contain only one set of motor leads.

2. Connect the three-phase AC output power motor leads to terminals U, V, and W (T1, T2, and T3) on the power terminal block on the drive.

3. Tighten the three-phase AC output power terminals to the proper torque according to drive type as shown in Table 3 on page 15.

Table 3 - AC Output Power Terminal Block Specifications

Voltage Rating	kW	Hp	Maximum Wire Size(1) mm^2 (AWG)	Minimum Wire Size mm^2 (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…4.0	1…5	4.0 (12)	0.34 (22)	0.6 (5)
	5.5…11	7.5…15	10.0 (8)	0.75 (18)	1.4 (12)
480V AC	0.75…7.5	1…10	4.0 (12)	0.34 (22)	0.6 (5)
	11…22	15…30	10.0 (8)	0.75 (18)	1.4 (12)
	30…37	40…50	25 (4)	2.5 (14)	2.71 (24)
	45	60	35 (2)	10.0 (8)	4.0 (35)
	55	75	55 (1/0)	2.5 (14)	(2)
	75	100	70 (2/0)	25 (4)	(2)
	90…132	125…200	120 (4/0)	2.5 (14)	6 (52)
600V AC	0.75…7.5	1…10	4.0 (12)	0.34 (22)	0.6 (5)
	11…22	15…30	10.0 (8)	0.75 (18)	1.4 (12)
	30…37	40…50	25.0 (4)	2.5 (14)	2.71 (24)
	45	60	35 (2)	10.0 (8)	4.0 (35)
	55	75	50.0 (1/0)	2.5 (14)	(2)
	75	100	70.0 (2/0)	25 (4)	(2)
	90…110	125…150	120 (4/0)	2.5 (14)	6 (52)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

(2) Refer to terminal block label inside drive.

Control and Signal Wiring

Refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about control and signal wiring.

The control I/O terminal block on the drives provide terminals for interfacing customer supplied control inputs and outputs. All analog and discrete control wiring is made at these terminals. Typical customer control and signal wiring is shown on the inter-connect drawings Figure 4 on page 27, Figure 5 on page 28 and Figure 6 on page 29.

Follow these steps to connect control and signal wiring to the drive package.

1. Wire the control and signal leads by routing them according to the drive option type. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. I/O terminal block specifications are listed in Table 4 on page 16.

   Control and signal wires must be separated from power wires by at least 0.3 m (1 ft).
2. Connect the control and signal wiring to the I/O terminals on the drive.
3. Tighten the I/O terminals to the proper torque according to drive type as shown in Table 4 on page 16.

Table 4 - I/O Terminal Block Specifications

Voltage Rating	kW	Hp	Maximum Wire Size[1] mm^2 (AWG)	Minimum Wire Size mm^2 (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…11	1…15	1.5 (16)	0.05 (30)	0.5 (4.4)
480V AC	0.75…37	1…50	1.5 (16)	0.05 (30)	0.5 (4.4)
	45…132	60…200	2.5 (14)	0.34 (22)	0.6 (5.2)
600V AC	0.75…15	1…20	1.5 (16)	0.05 (30)	0.5 (4.4)
	18.5…110	25…150	2.5 (14)	0.34 (22)	0.6 (5.2)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

Parameter Defaults
Main Input Disconnect Package (style A)

Refer to the PowerFlex 70 AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for detailed information on parameters and programming.

Parameter Name	Number	Default
Output Freq	001	Read Only
Commanded Freq	002	Read Only
Output Current	003	Read Only
Output Voltage	004	Read Only
Flux Current	005	Read Only
Output Voltage	006	Read Only
Output Power	007	Read Only
Output Powr Fctr	008	Read Only
Elapsed MWh	009	Read Only
Elapsed Run Time	010	Read Only
MOP Frequency	011	Read Only
DC Bus Voltage	012	Read Only
DC Bus Memory	013	Read Only
Elapsed kWh	014(1)	Read Only
Analog In1 Value	016	Read Only
Analog In2 Value	017	Read Only
Ramped Speed	022(1)	Read Only
Speed Reference	023(1)	Read Only
Commanded Torque	024(1)	Read Only
Speed Feedback	025(1)	Read Only
Rated kW	026	Read Only
Rated Volts	027	Read Only
Rated Amps	028	Read Only
Control SW Ver	029	Read Only
Motor Type	040	Induction
Motor NP Volts	041	Drive Rating Based
Motor NP FLA	042	Drive Rating Based
Motor NP Hertz	043	Drive Rating Based
Motor NP PRM	044	Drive Rating Based
Motor NP Power	045	Drive Rating Based
Mtr NP Pwr Units	046	Drive Rating Based
Motor OL Hertz	047	Motor NP Hz/3
Motor OL Factor	048	1.00
Motor Poles	049(1)	4
Motor Cntl Sel	053(2)	3 “FAN/Pump V/Hz”
Maximum Voltage	054	Drive Rated Volts
Maximum Freq	055	110.0 or 130.0 Hz
Compensation	056	Bits 0 - 6 0101111
Flux Up Mode	057	“Manual”
Flux Up Time	058	0.000 Secs
SV Boost Filter	059	500
Autotune	061	“Calculate”
IR Voltage Drop	062	Based on Drive Rating
Flux Current Ref	063	Based on Drive Rating
Ixo Voltage Drop	064	Based on Drive Rating
Autotune Torque	066(1)	50%
Inertia Autotune	067(1)	“Ready”
St Acc Boost	069	Based on Drive Rating
Run Boost	070	Based on Drive Rating
Break Voltage	071	[Motor NP Volts] × 0.25
Break Frequency	072	[Motor NP Hz] × 0.25
Speed Units	079	0 “Hz”
Feedback Select]	080	0 “Open Loop”
Minimum Speed	081	0.0
Maximum Speed	082	50.0 or 60.0 Hz (volt class) [Motor NP RPM]
Overspeed Limit	083	10.0 Hz 300.0 RPM
Skip Frequency 1	084	0.0 Hz
Skip Frequency 2	085	0.0 Hz
Skip Frequency 3	086	0.0 Hz
Skip Freq Band	087(2)	1.0 Hz
Speed/Torque Mod	088(1)	1 “Speed Reg”
Speed Ref A Sel	090(2)	1 “Analog In 1”
Speed Ref A Hi	091	Maximum Speed
Speed Ref A Lo	092	0.0
Speed Ref B Sel	093(2)	18 “DPI Port 1”
Speed Ref B Hi	094	Maximum Speed
Speed Ref B Lo	095	0.0
TB Man Ref Sel	096	1 “Analog In 1”
TB Man Ref Hi	097	Maximum Speed
TB Man Ref Lo	098	0.0
Pulse Input Ref	099	Read Only
Jog Speed 1	100	10.0 Hz
Preset Speed 1	101	5.0 Hz
Preset Speed 2	102(2)	5.0 Hz
Preset Speed 3	103	20.0 Hz
Preset Speed 4	104	30.0 Hz
Preset Speed 5	105	40.0 Hz
Preset Speed 6	106	50.0 Hz
Preset Speed 7	107	6.0 Hz
Jog Speed 2	108	10.0 Hz
Trim % Setpoint	116(1)	0.0%
Trim In Select	117	2 “Analog In 2”
Trim Out Select	118	0 (Disable)
Trim Hi	119	60.0 Hz
Trim Lo	120	0.0 Hz
Slip RPM @ FLA	121	Based on [Motor NP RPM]
Slip Comp Gain	122	40.0
Slip RPM Meter	123	Read Only
PI Configuration	124	0 (Disable)
PI Control	125	0 (Disable)
PI Reference Sel	126	0 “PI Setpoint”
PI Setpoint	127	50.00%
PI Feedback Sel	128	0 “PI Setpoint”
PI Integral Time	129	2.00 Secs
PI Prop Gain	130	1.0
PI Lower Limit	131	–[Maximum Freq] –100%
PI Upper Limit	132	+[Maximum Freq] 100%
PI Preload	133	0.0 Hz 100.0%
PI Status	134	Read Only
PI Ref Meter	135	Read Only
PI Fdback Meter	136	Read Only
PI Error Meter	137	Read Only
PI Output Meter	138	Read Only

Parameter Name	Number	Default
PI BW Filter	139[1]	0.0 Radians
Accel Time 1	140[2]	20.0 Secs
Accel Time 2	141[2]	20.0 Secs
Decel Time 1	142[2]	20.0 Secs
Decel Time 2	143[2]	20.0 Secs
DB While Stopped	145[1]	0 “Disabled”
S Curve %	146[2]	20%
Current Lmt Sel	147	0 “Cur Lim Val”
Current Lmt Val	148	[Rated Amps] × 1.5 (Equation yields approximate default value.)
Current Lmt Gain	149	250
Drive OL Mode	150	3 “Both–PWM 1st”
PWM Frequency	151	4 kHz 2 kHz (Frames 4…6, 600/690VAC)
Droop RPM @ FLA	152[1]	0.0 RPM
Regen Power Limit	153[1]	–50.0%
Current Rate Limit	154[1]	400.0%
Stop Mode A	155[2]	0 “Coast”
Stop Mode B	156[2]	1 “Ramp”
DC Brake Lvl Sel	157	0 “DC Brake Lvl”
DC Brake Level	158	[Rated Amps]
DC Brake Time	159	0.0 Secs
Bus Reg Ki	160	450
Bus Reg Mode A	161	1 “Adjust Freq”
Bus Reg Mode B	162[2]	0 “Disabled”
DB Resistor Type	163	0 “None”
Bus Reg Kp	164[2]	1200
Bus Reg Kd	165	1000
Flux Braking	166[1]	0 “Disabled”
Powerup Delay	167[1]	0.0 Secs
Start At PowerUp	168[2]	1 “Enabled”
Flying Start En	169[2]	1 “Enabled”
Flying StartGain	170	4000
Auto Rstrt Tries	174	0
Auto Rstrt Delay	175[2]	30.0 Secs
Gnd Warn Level	177[1]	3.0 Amps
Sleep-Wake Mode	178	0 “Disabled”
Sleep-Wake Ref	179	2 “Analog In 2”

Parameter Name	Number	Default
Wake Level	180	6.000 mA, 6.000 Volts
Wake Time	181	1.0 Secs
Sleep Level	182	5.000 mA, 5.000 Volts
Sleep Time	183	1.0 Secs
Power Loss Mode	184	0 “Coast”
Power Loss Time	185	0.5 Secs
Power Loss Level	186[3]	Drive Rated Volts
Load Loss Level	187[1]	200.0%
Load Loss Time	188[1]	0.0 Secs
Shear Pin Time	189[1]	0.0 Secs
Direction Mode	190[2]	2 “Reverse Dis”
Save HIM Ref	192	0 Hz
Man Ref Preload	193[3]	0 “Disabled”
Save MOP Ref	194[2]	At Pwr Down
MOP Rate	195	1.0 Hz/s 30.0 RPM/s
Param Access Lvl	196[2]	3 “Fan/Pump”
Reset To Defalts	197	0 “Ready”
Load Frm Usr Set	198	0 “Ready”
Save To User Set	199	0 “Ready”
Reset Meters	200	0 “Ready”
Language	201	0 “Not Selected”
Voltage Class	202	Based on Drive Cat. No.
Drive Checksum	203	Read Only
Dyn UsrSet Cnfg	204[1]	0 “Disabled”
Dyn UsrSet Sel	205[1]	0 “Disabled”
Dyn UsrSet Actv	206[1]	0 “Disabled”
Drive Status 1	209	Read Only
Drive Status 2	210	Read Only
Drive Alarm 1	211	Read Only
Drive Alarm 2	212	Read Only
Speed Ref Source	213	Read Only
Start Inhibits	214	Read Only
Last Stop Source	215	Read Only
Dig In Status	216	Read Only
Dig Out Status	217	Read Only
Drive Temp	218	Read Only
Drive OL Count	219	Read Only
Motor OL Count	220	Read Only

Parameter Name	Number	Default
Fault Speed	224	Read Only
Fault Amps	225	Read Only
Fault Bus Volts	226	Read Only
Status 1 @ Fault	227	Read Only
Status 2@ Fault	228	Read Only
Alarm 1 @ Fault	229	Read Only
Alarm 2@ Fault	230	Read Only
Testpoint 1 Sel	234	499
Testpoint 2 Sel	236	499
Testpoint 1 Data	235	Read Only
Testpoint 2 Data	237	Read Only
Fault Config 1	238	Bits 0…15 01x1001000x000xx
Fault Clear	240	0 “Ready”
Fault Clear Mode	241	1 “Enabled”
Power Up Marker	242	Read Only
Fault 1 Code	243	Read Only
Fault 1 Time	244	Read Only
Fault 2 Code	245	Read Only
Fault 2 Time	246	Read Only
Fault 3 Code	247	Read Only
Fault 3 Time	248	Read Only
Fault 4 Code	249	Read Only
Fault 4 Time	250	Read Only
Fault 5 Code	251[3]	Read Only
Fault 5 Time	252[3]	Read Only
Fault 6 Code	253[3]	Read Only
Fault 6Time	254[3]	Read Only
Fault 7 Code	255[3]	Read Only
Fault 7 Time	256[3]	Read Only
Fault 8 Code	257[3]	Read Only
Fault 8 Time	258[3]	Read Only
Alarm Config 1	259	Bits 0…15 000000x00000000x
Alarm Clear	261[3]	0 “Ready”
Alarm 1 Code	262[3]	Read Only
Alarm 2 Code	263[3]	Read Only
Alarm 3 Code	264[3]	Read Only
Alarm 4 Code	265[3]	Read Only
Alarm 5 Code	266[3]	Read Only
Alarm 6 Code	267[3]	Read Only

Parameter Name	Number	Default
Alarm 7 Code	268[3]	Read Only
Alarm 8 Code	269[3]	Read Only
DPI Baud Rate	270	1 “500kbps”
Drive Logic Rslt	271	Read Only
Drive Ref Rslt	272	Read Only
Drive Ramp Rslt	273	Read Only
DPI Port Sel	274[1]	“DPI Port 1”
DPI Port Value	275[1]	Read Only
Logic Mask	276[1]	1 - Control Permitted
Start Mask	277	(See Logic Mask)
Jog Mask	278	(See Logic Mask)
Direction Mask	279	(See Logic Mask)
Reference Mask	280	(See Logic Mask)
Accel Mask	281	(See Logic Mask)
Decel Mask	282	(See Logic Mask)
Fault Clr Mask	283	(See Logic Mask)
MOP Mask	284	(See Logic Mask)
Local Mask	285	(See Logic Mask)
Stop Owner	288	Read Only
Start Owner	289	(See Stop Owner)
Jog Owner	290	(See Stop Owner)
Direction Owner	291	(See Stop Owner)
Reference Owner	292	(See Stop Owner)
Accel Owner	293	(See Stop Owner)
Decel Owner	294	(See Stop Owner)
Fault Clr Owner	295	(See Stop Owner)
MOP Owner	296	(See Stop Owner)
Local Owner	297	(See Stop Owner)
DPI Ref Select	298[1]	0 “Max Freq”
DPI Fdbk Select	299	17 “Speed Fdbk”
Data In A1 - Link A Word 1	300	0(0 = “Disabled)
Data In A2 - Link A Word 2	301	0(0 = “Disabled)
Data In B1 - Link B Word 1	302	(See Data In A1 - Link A Word 1)
Data In B2 - Link B Word 2	303	(See Data In A2 - Link A Word 2)
Data In C1 - Link C Word 1	304	(See Data In A1 - Link A Word 1)
Data In C2 - Link C Word 2	305	(See Data In A2 - Link A Word 2)
Data In D1 - Link D Word 1	306	(See Data In A1 - Link A Word 1)
Data In D2 - Link D Word 2	307	(See Data In A2 - Link A Word 2)
Data Out A1 - Link A Word 1	310	0(0 = “Disabled)
Data Out A2 - Link A Word 2	311	0(0 = “Disabled)
Data Out B1 - Link A Word 1	312	(See Data Out A1 - Link A Word 1)
Data Out B2 - Link A Word 2	313	(See Data Out A2 - Link A Word 2)
Data Out C1 - Link A Word 1	314	(See Data Out A1 - Link A Word 1)
Data Out C2 - Link A Word 2	315	(See Data Out A2 - Link A Word 2)
Data Out D1 - Link A Word 1	316	(See Data Out A1 Link A Word 1)
Data Out D2 - Link A Word 2	317	(See Data Out A2 - Link A Word 2)
Anlg In Config	320[2]	Analog In 1 = 0.0 Volt
Anlg In Sqr Root	321	0 (Disable)
Analog In 1 Hi	322	10.000 Volt
Analog In 1 Lo	323	0.000 Volt
Analog In 1 Loss	324	0 “Disabled”
Analog In 2 Hi	325	10.000 Volt
Analog In 2 Lo	326	0.000 Volt
Analog In 2 Loss	327	0 “Disabled”
Anlg Out Config	340	1 (Current)
Anlg Out Absolut	341	1 (Absolute)
Analog Out1 Sel	342	0 “Output Freq”
Analog Out1 Hi	343	20.000 mA, 10.000 Volts
Analog Out1 Lo	344	0.000 mA, 0.000 Volts
Analog Out2 Sel	345	0 “Output Freq”
Analog Out Hi	346	20.000 mA, 10.000 Volts
Analog Out2 Lo	347	0.000 mA, 0.000 Volts
Anlg Out1 Scale	354[1]	0.0
Anlg Out2 Scale	355[1]	0.0
Digital In1 Sel	361	4 “Stop – CF”
Digital In2 Sel	362	5 “Start”
Digital In3 Sel	363[2]	3 “Aux Fault”
Digital In4 Sel	364[2]	1 “Enable”
Digital In5 Sel	365[2]	15 “Speed Sel 1”
Digital In6 Sel	366[2]	16 “Speed Sel 2”
Anlg1 Out Setpt	377[1]	20.000 mA, 10.000 Volts
Anlg2 Out Setpt	378	20.000 mA, 10.000 Volts
Dig Out Setpt	379[1]	0 (Disable)
Digital Out1 Sel	380[4]	1 “Fault”
Dig Out1 Level	381	0.0
Dig Out1 OnTime	382	0.00 Secs
Dig Out1 OffTime	383	0.00 Secs
Digital Out2 Sel	384	4 “Run”
Dig Out2 Level	385	0.0
Dig Out2 OnTime	386	0.00 Secs
Dig Out2 OffTime	387	0.00 Secs
Digital Out3 Sel	388	4 “Run”
Dig Out3 Level	389	0.0
Dig Out3 OnTime	390	0.00 Secs
Dig Out3 OffTime	391	0.00 Secs
Dig Out Param	393	0 “PI Config”
DigIn DataLogic	411[1]	0=Logical 0
Motor Fdbk Type	412[1]	0 “Quadrature”
Encoder PPR	413[1]	1024 PPR
Enc Position Fdbk	414[1]	Read Only
Encoder Speed	415[1]	Read Only
Fdbk Filter Sel	416[1]	0 “None”
Notch FilterFreq	419[1]	0.0 Hz
Notch Filter K	420[1]	0.3 Hz
Marker Pulse	421	Read Only
Pulse In Scale	422	64
Encoder Z Chan	423	0 “Pulse Input”
Torque Ref A Sel	427	1 “Torque Stpt1”
Torque Ref A Hi	428[1]	100.0%
Torque Ref A Lo	429[1]	0.0%
Torq Ref A Div	430[1]	1.0
Torque Ref B Sel	431	24 “Disabled”
Torque Ref B Hi	432	100.0%
Torque Ref B Lo	433	0.0%
Torque Ref B Mult	434	1.0
Torque Setpoint1	435[1]	0.0%
Pos Torque Limit	436[1]	200.0%

Parameter Name	Number	Default
Neg Torque Limit	437(1)	-200.0%
Torque Setpoint2	438	0.0%
Control Status	440(1)	Read Only
Mtr Tor Cur Ref	441(1)	Read Only
Ki Speed Loop	445(1)	7.0
Kp Speed Loop	446(1)	6.3
Kf Speed Loop	447(1)	0.0
Speed Desired BW	449(1)	0.0 Radians/Sec
Total Inertia	450(1)	1.25 Secs 0.10 Secs (v3)
Speed Loop Meter	451(1)	Read Only
Rev Speed Limit	454(1)	0.0 RPM
PI Deriv Time	459(1)	0.00 Secs
PI Reference Hi	460(1)	100.0%
PI Reference Lo	461(1)	-100.0%
PI Feedback Hi	462(1)	100.0%
PI Feedback Lo	463(1)	0.0%
Scale1 In Value	476	0.0
Scale1 In Hi	477	0.0
Scale1 In Lo	478	0.0
Scale1 Out Hi	479	0.0
Scale1 Out Lo	480	0.0
Scale1 Out Value	481	Read Only
Scale2 In Value	482	0.0
Scale2 In Hi	483	0.0
Scale2 In Lo	484	0.0
Scale2 Out Hi	485	0.0
Scale2 Out Lo	486	0.0
Scale2 Out Value	487	Read Only
Scale3 In Value	488	0.0
Scale3 In Hi	489	0.0
Scale3 In Lo	490	0.0
Scale3 Out Hi	491	0.0
Scale3 Out Lo	492	0.0
Scale3 Out Value	493	Read Only
Scale4 In Value	494	0.0
Scale4 In Hi	495	0.0
Scale4 In Lo	496	0.0
Scale4 Out Hi	497	0.0
Scale4 Out Lo	498	0.0
Scale4 Out Value	499	Read Only
PortMask Act	595(1)	Read Only
Write Mask Cfg	596(1)	1 = Write Permitted
Write Mask Act	597(1)	Read Only
Logic Mask Act	598(1)	Read Only
TorqProve Cnfg	600	0 (Disable)
TorqProve Setup	601	0 (Disable)
Spd Dev Band	602	2.0 Hz 60.0 RPM
SpdBand Integrat	603	60 mSec
Brk Release Time	604	0.10 Secs
ZeroSpdFloatTime	605	5.0 Secs
Float Tolerance	606	0.2 Hz 6.0 RPM
Brk Set Time	607	0.10 Secs
TorqLim SlewRate	608	10.0 Secs
BrkSlip Count	609	250
Brk Alarm Travel	610	1.0 Revs
MicroPos Scale%	611	10.0%

(1) Applicable only to PowerFlex 70 Packages.
(2) The default values for these parameters differ from the factory defaults. Setting 194 [Reset To Defalts] to 1 "Factory Rset" changes these parameter settings to the defaults listed in the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001.
(3) Applicable only to PowerFlex 700 Packages.
(4) When [TorqProve Cnfg] is set to "Enable," [Digital Out1 Sel] becomes the brake control and any other selection is ignored.

ATTENTION: Parameter 168 [Start At PowerUp] ships from the factory enabled. This feature enables a Run command to automatically cause the drive to resume running at commanded speed after drive input power is restored. Equipment damage and/or personal injury can result if this parameter is used in an inappropriate application. Do not use this function without considering applicable local, national and international codes, standards, regulations, or industry guidelines.

Drawing Index

Main Input Disconnect Drive Packages (style A)

The tables on the following pages provide links to the drawings for the various voltages and kW/Hp ratings for the style A packaged drives:

- Table 5, Main Input Disconnect Drive Packages (style A), 208V on page 21
- Table 6, Main Input Disconnect Drive Packages (style A), 480V on page 22
- Table 7, Main Input Disconnect Drive Packages (style A), 600V on page 23

Table 5 - Main Input Disconnect Drive Packages (style A), 208V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
208V AC	0.75	1	No	Figure 17 on page 40	Figure 7 on page 30	Figure 1 on page 24	Figure 4 on page 27
	1.5	2					
	2.2	3					
	4	5		Figure 18 on page 41	Figure 8 on page 31		
	5.5	7.5		Figure 19 on page 42			
	7.5	10					
	11	15		Figure 20 on page 43	Figure 9 on page 32		
	0.75	1	Yes	Figure 25 on page 48	Figure 14 on page 37	Figure 2 on page 25	Figure 6 on page 29
	1.5	2					
	2.2	3					
	4	5		Figure 26 on page 49	Figure 15 on page 38		
	5.5	7.5		Figure 27 on page 50	Figure 16 on page 39		
	7.5	10					

Table 6 - Main Input Disconnect Drive Packages (style A), 480V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
480V AC	0.75	1.0	No	Figure 17 on page 40	Figure 7 on page 30	Figure 1 on page 24	Figure 4 on page 27
	1.5	2.0					
	2.2	3.0					
	4.0	5.0					
	5.5	7.5		Figure 18 on page 41	Figure 8 on page 31		
	7.5	10					
	11	15		Figure 19 on page 42			
	15	20					
	18.5	25					
	22	30		Figure 20 on page 43	Figure 9 on page 32		
	30	40		Figure 21 on page 44	Figure 10 on page 33		
	37	50					
	45	60		Figure 22 on page 45	Figure 11 on page 34	Figure 3 on page 26	Figure 5 on page 28
	55	75		Figure 23 on page 46			
	75	100					
	90	125		Figure 24 on page 47	Figure 13 on page 36		
	110	150					
	132	200					
	0.75	1.0	Yes	Figure 25 on page 48	Figure 14 on page 37	Figure 2 on page 25	Figure 6 on page 29
	1.5	2.0					
	2.2	3.0					
	4.0	5.0					
	5.5	7.5		Figure 26 on page 49	Figure 15 on page 38		
	7.5	10					
	11	15		Figure 27 on page 50	Figure 16 on page 39		
	15	20					
	18.5	25					

Table 7 - Main Input Disconnect Drive Packages (style A), 600V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
600V AC	2.2	3.0	No	Figure 17 on page 40	Figure 7 on page 30	Figure 1 on page 24	Figure 4 on page 27
	4.0	5.0					
	5.5	7.5		Figure 18 on page 41	Figure 8 on page 31		
	7.5	10					
	11	15		Figure 19 on page 42			
	15	20					
	18.5	25					
	22	30		Figure 20 on page 43	Figure 9 on page 32		
	30	40		Figure 21 on page 44	Figure 10 on page 33		
	37	50					
	45	60		Figure 22 on page 45	Figure 11 on page 34	Figure 3 on page 26	Figure 5 on page 28
	55	75		Figure 23 on page 46	Figure 12 on page 35		
	75	100					
	90	125		Figure 24 on page 47	Figure 13 on page 36		
	110	150					
	2.2	3.0	Yes	Figure 25 on page 48	Figure 14 on page 37	Figure 2 on page 25	Figure 6 on page 29
	4.0	5.0					
	5.5	7.5		Figure 26 on page 49	Figure 15 on page 38		
	7.5	10					
	11	15		Figure 27 on page 50	Figure 16 on page 39		
	15	20					
	18.5	25					

Schematic Drawings

Figure 1 - 1…15 Hp, 208V AC; and 1…50 Hp, 480V AC and 600V AC Drives

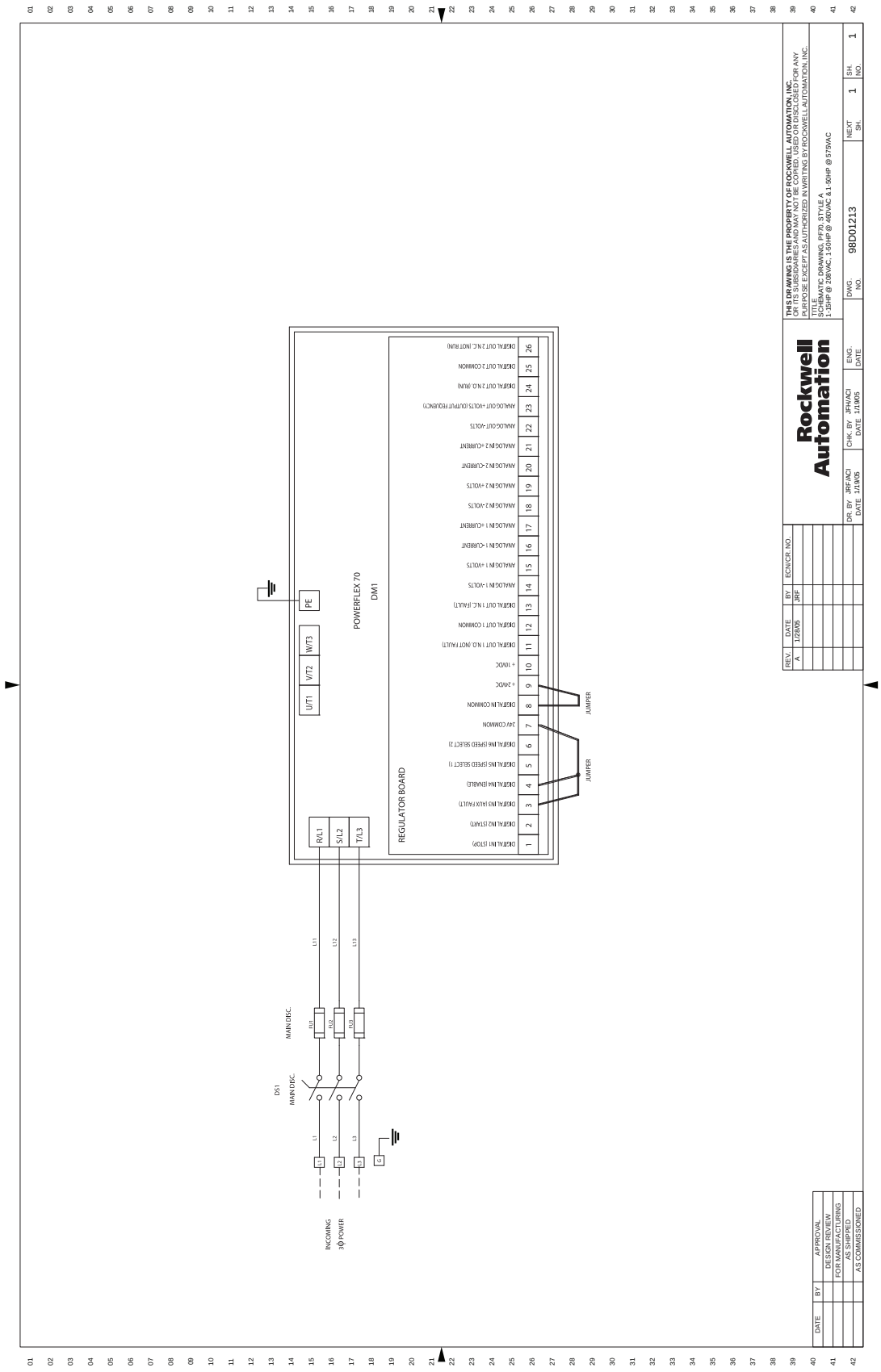


Figure 2 - 1…10 Hp, 208V AC; and 1…25 Hp, 480V AC and 600V AC Drives with Line Reactor

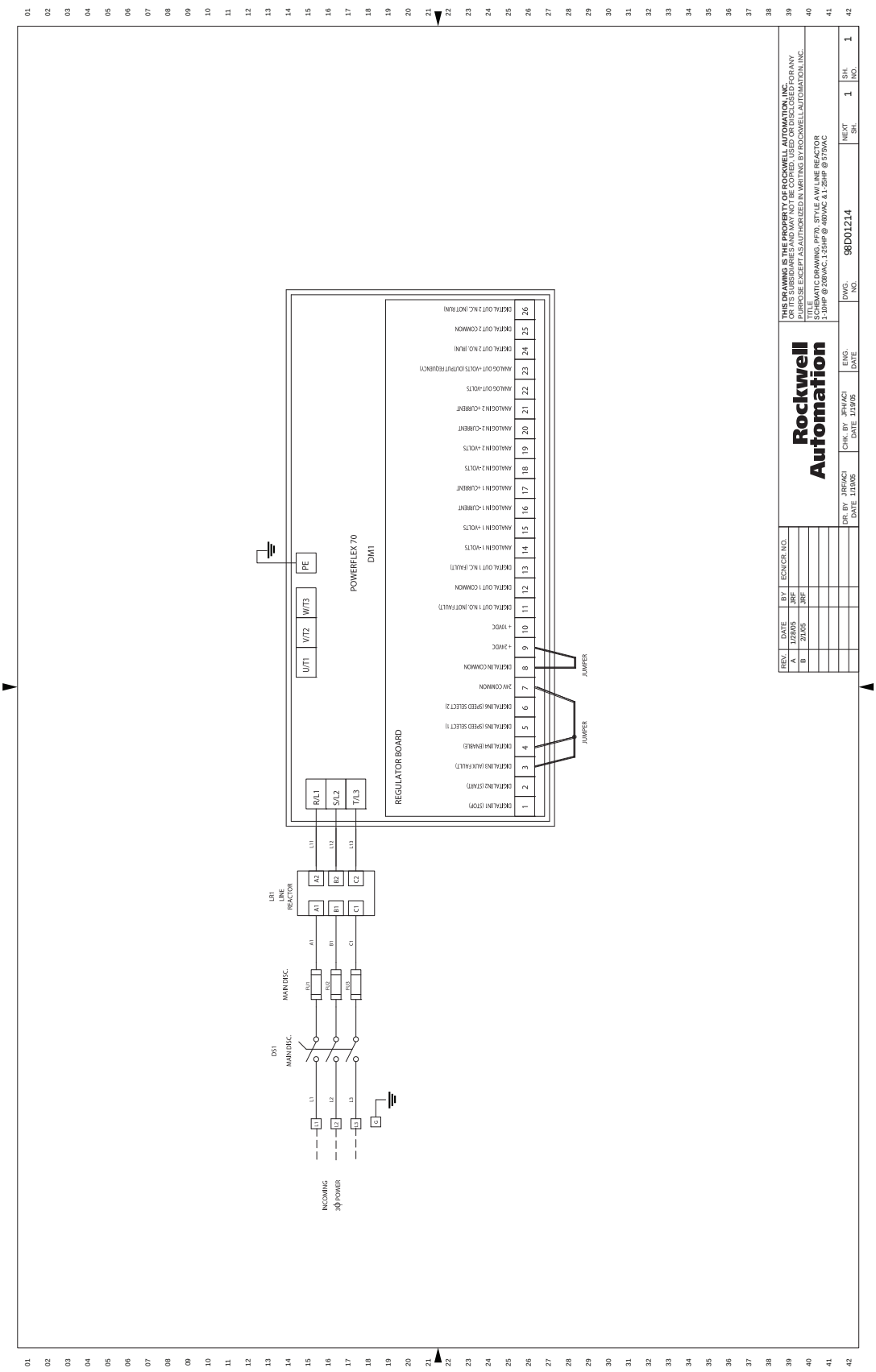
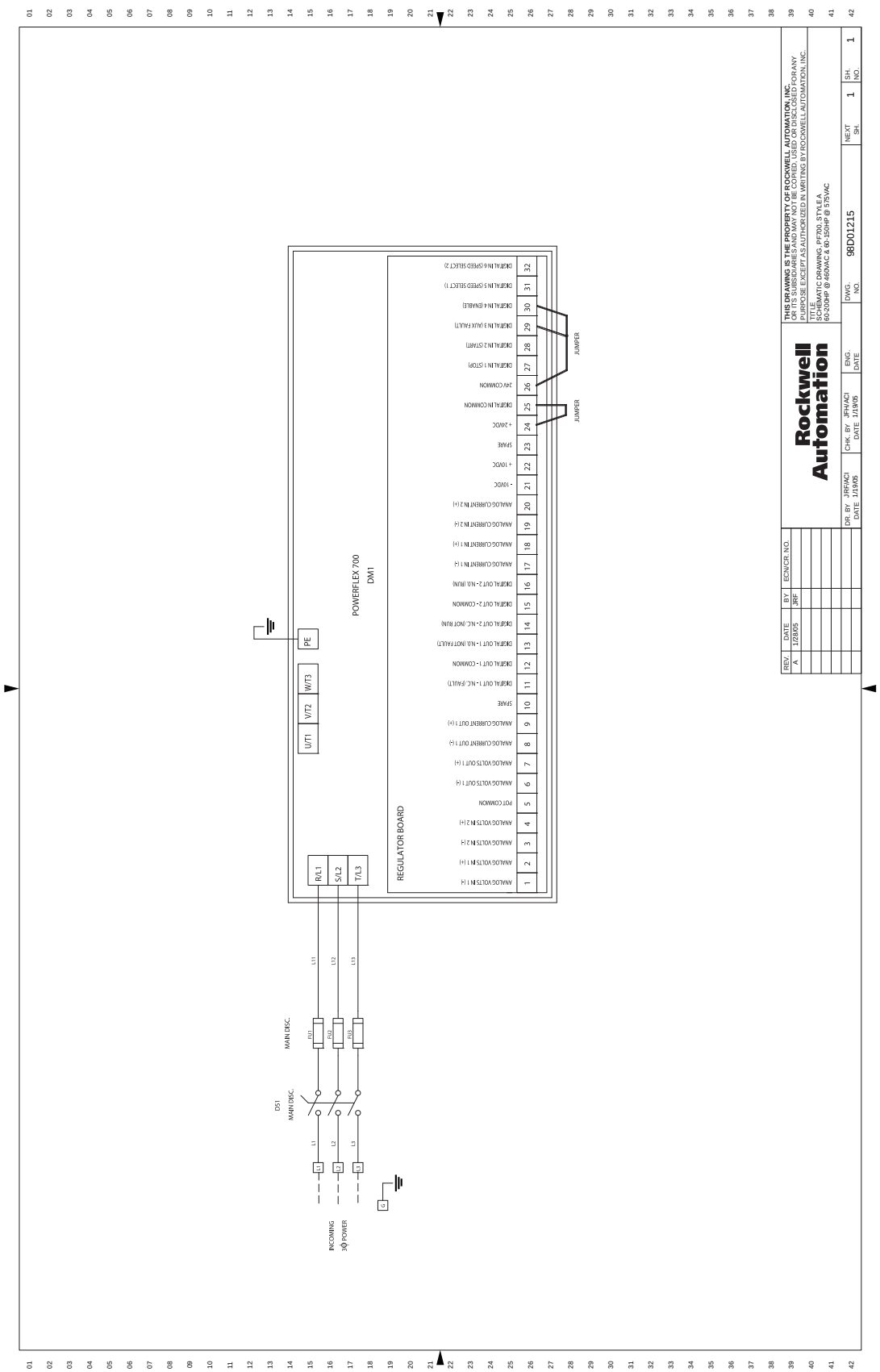


Figure 3 - 60 … 200 Hp, 480V AC; and 60 … 150 Hp, 600V AC Drives



Inter-connect Drawings

Figure 4 - 1…15 Hp, 208V AC; and 1…50 Hp, 480V AC and 600V AC Drives

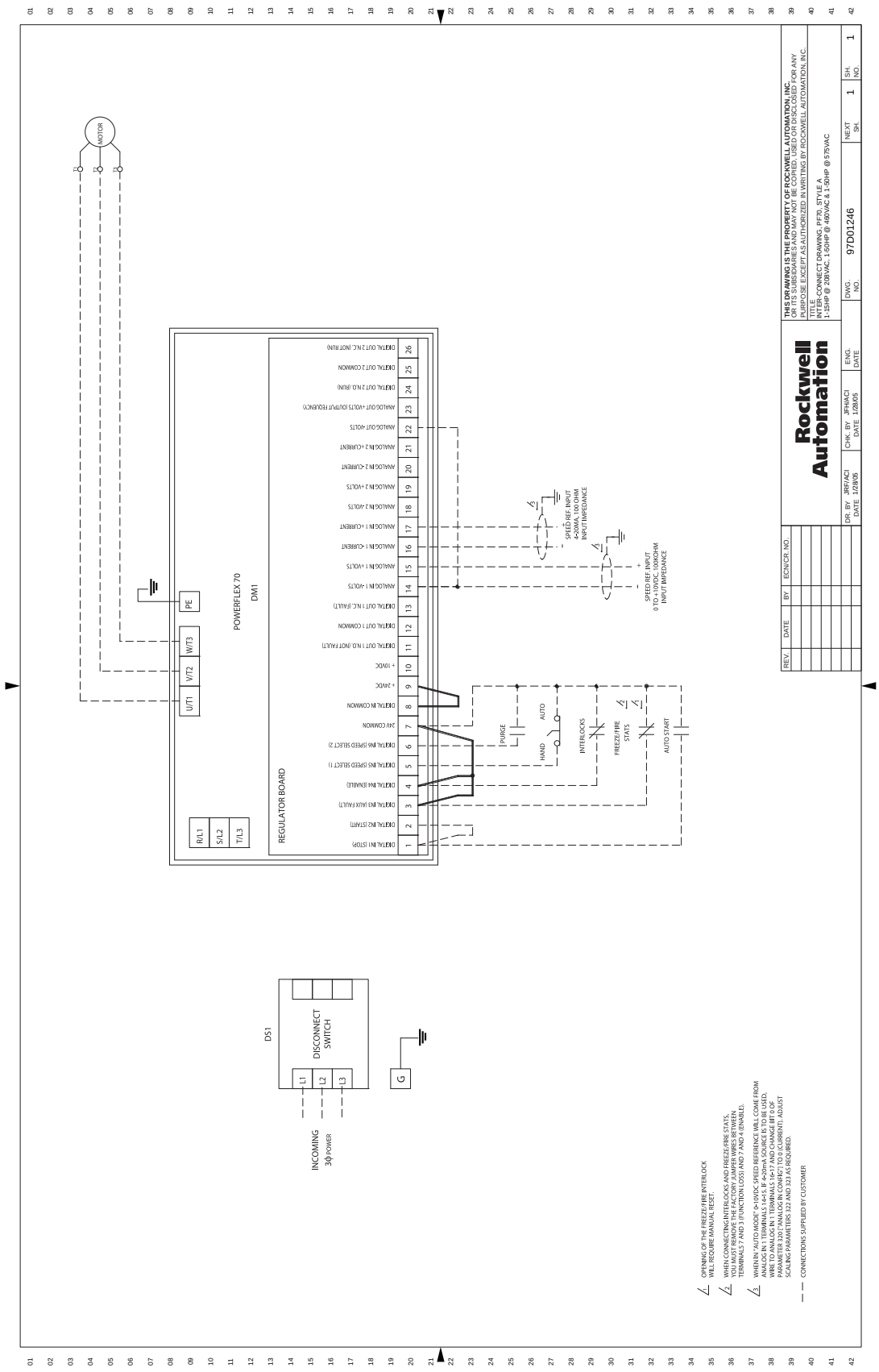


Figure 5 - 60…200 Hp, 480V AC; and 60…150 Hp, 600V AC Drives

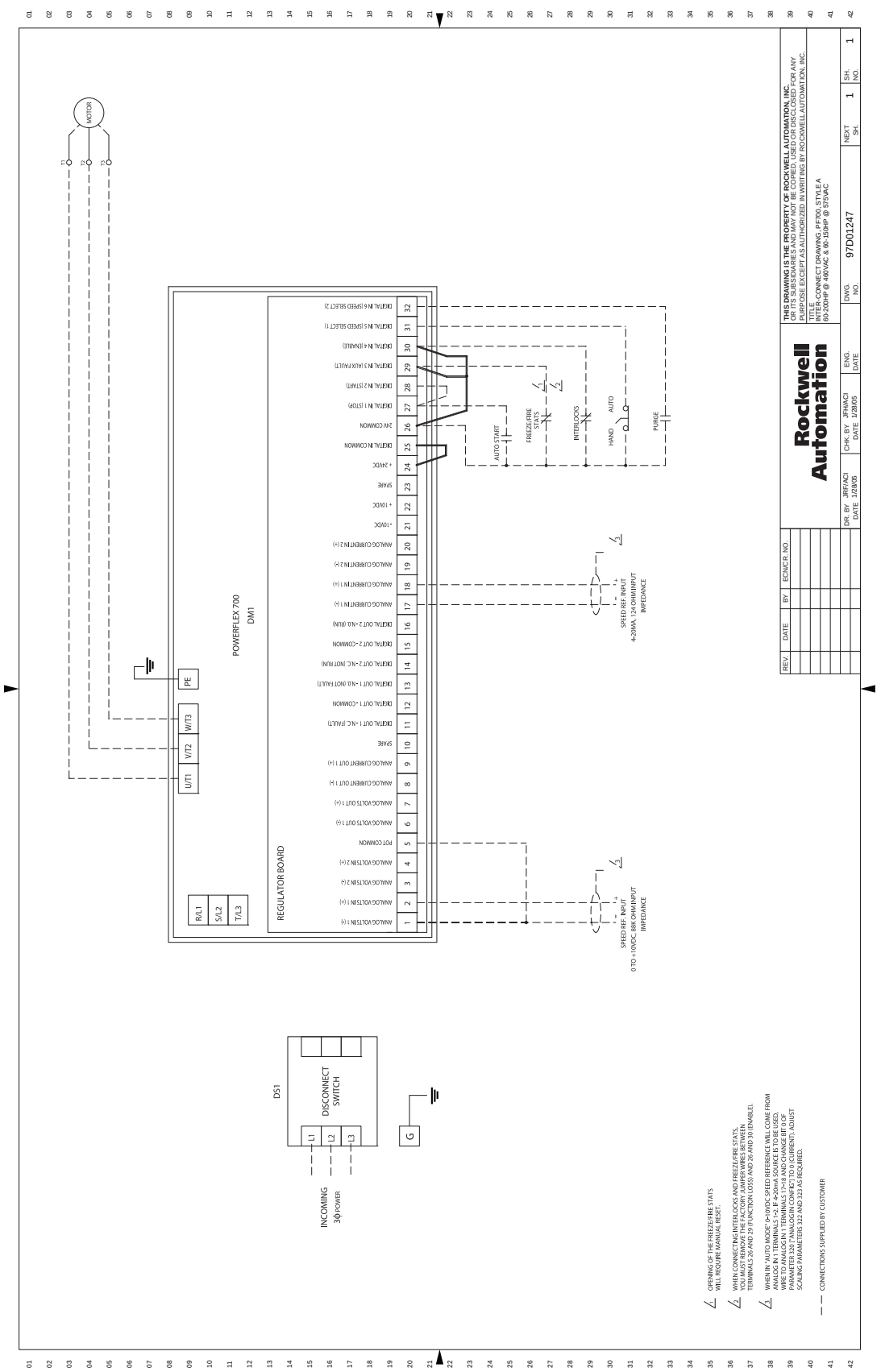
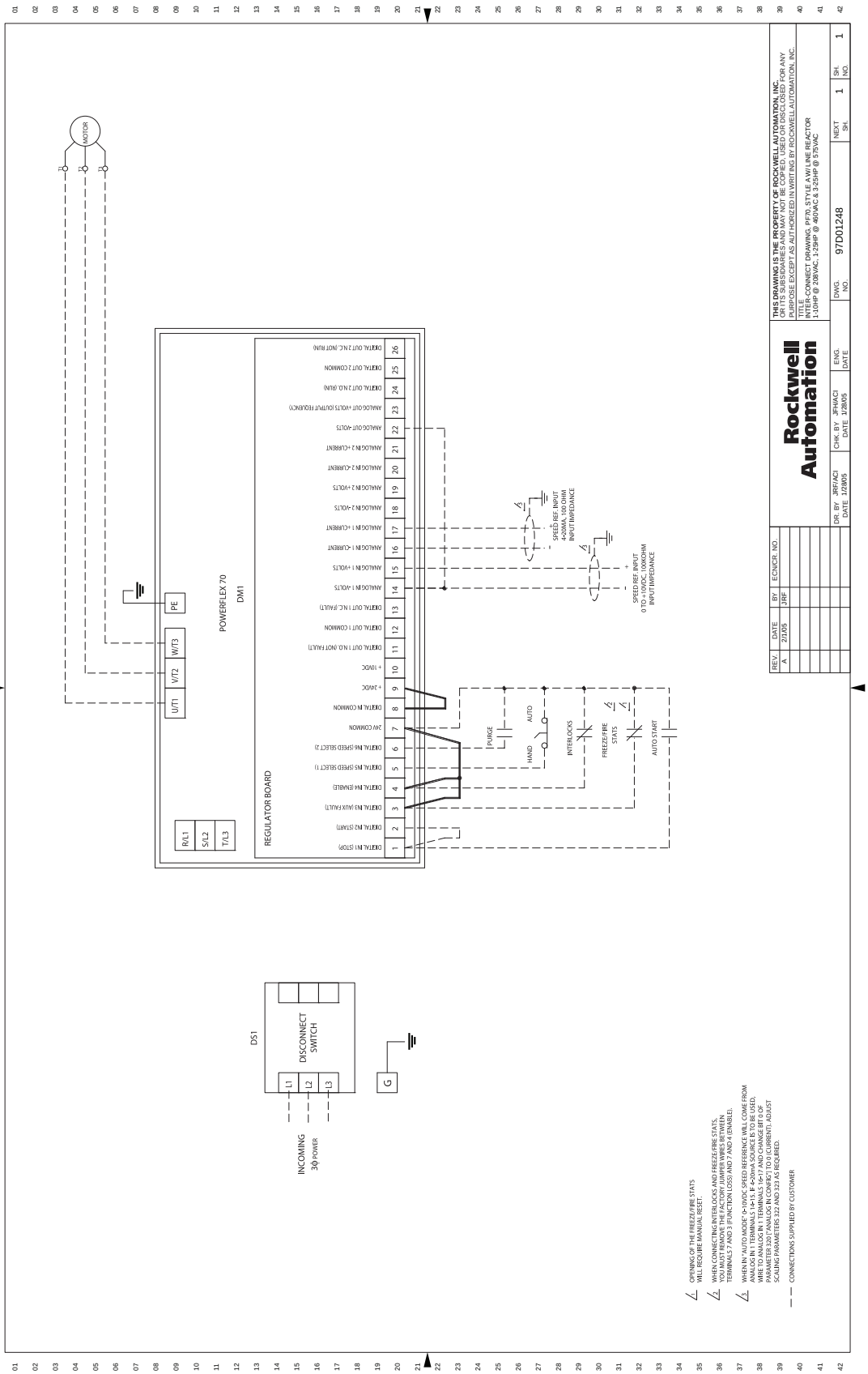


Figure 6 - 1…10 Hp, 208V AC; 1…25 Hp, 480V AC; and 3…25 Hp, 600V AC Drives with Line Reactor



Layout Drawings

Figure 7 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp 600V AC Drives

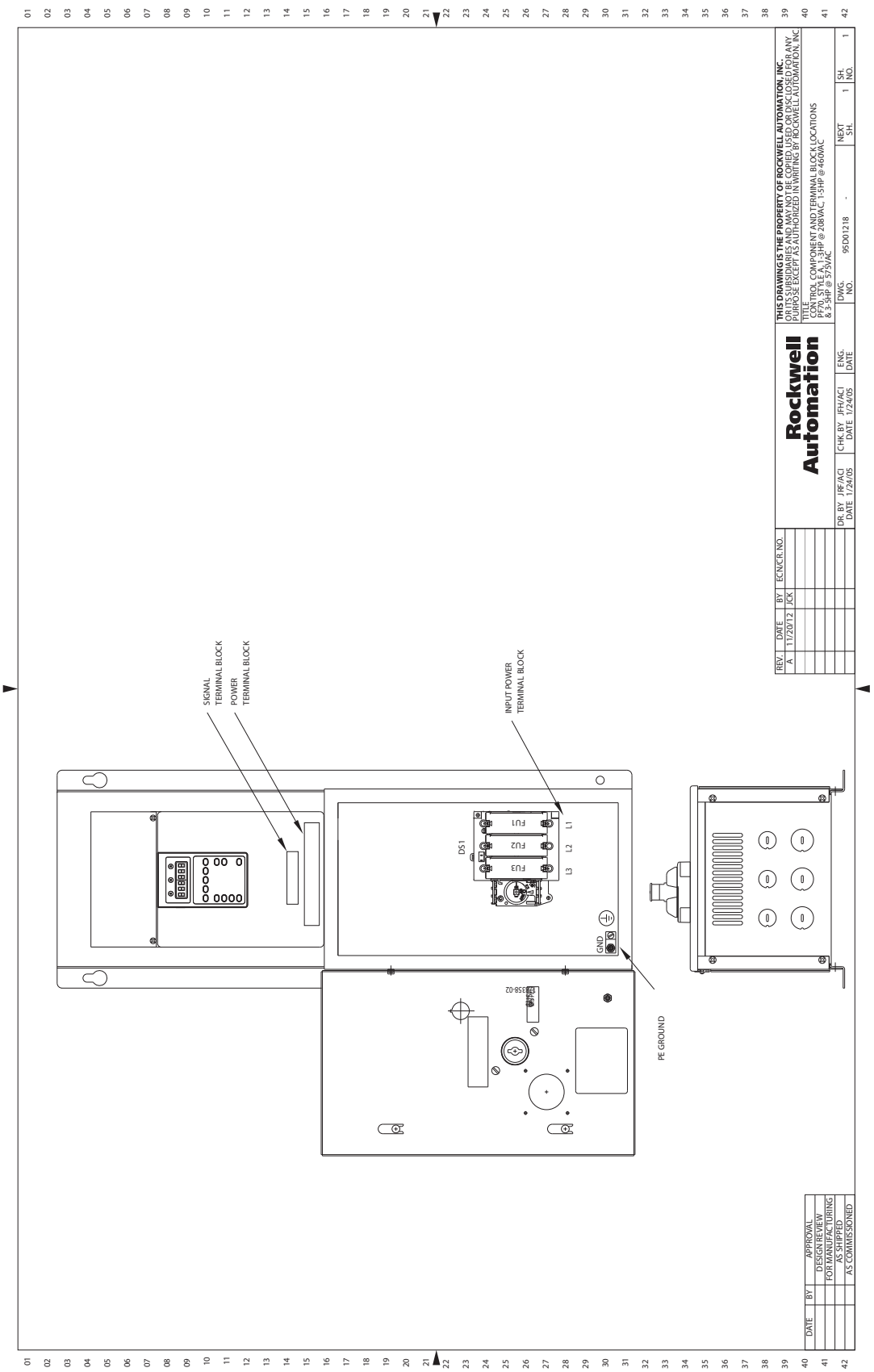


Figure 8 - 5…10 Hp, 208V AC; and 7.5…25 Hp, 480V AC and 600V AC Drives

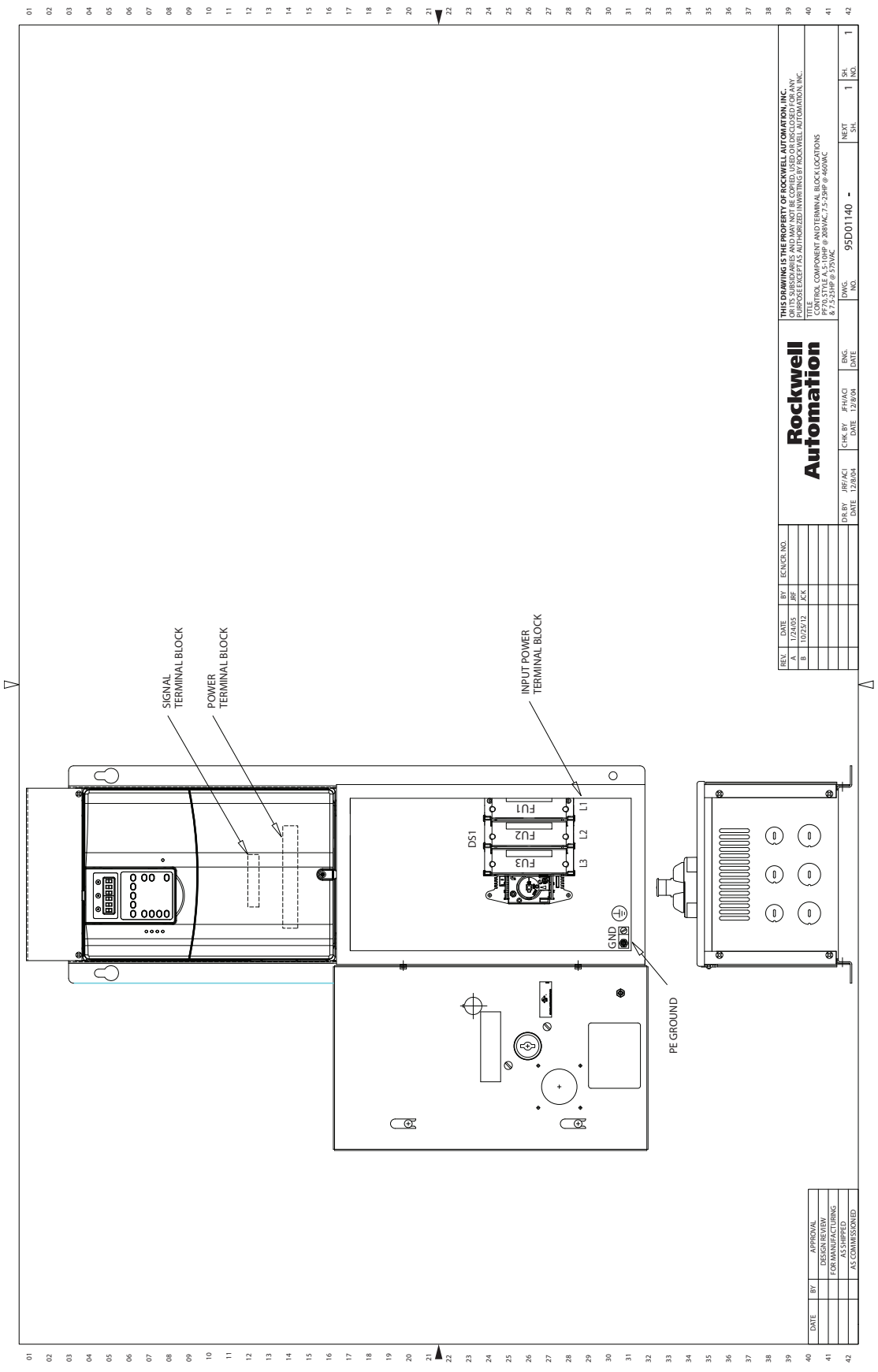


Figure 9 - 30 Hp, 480V AC and 600V AC Drives

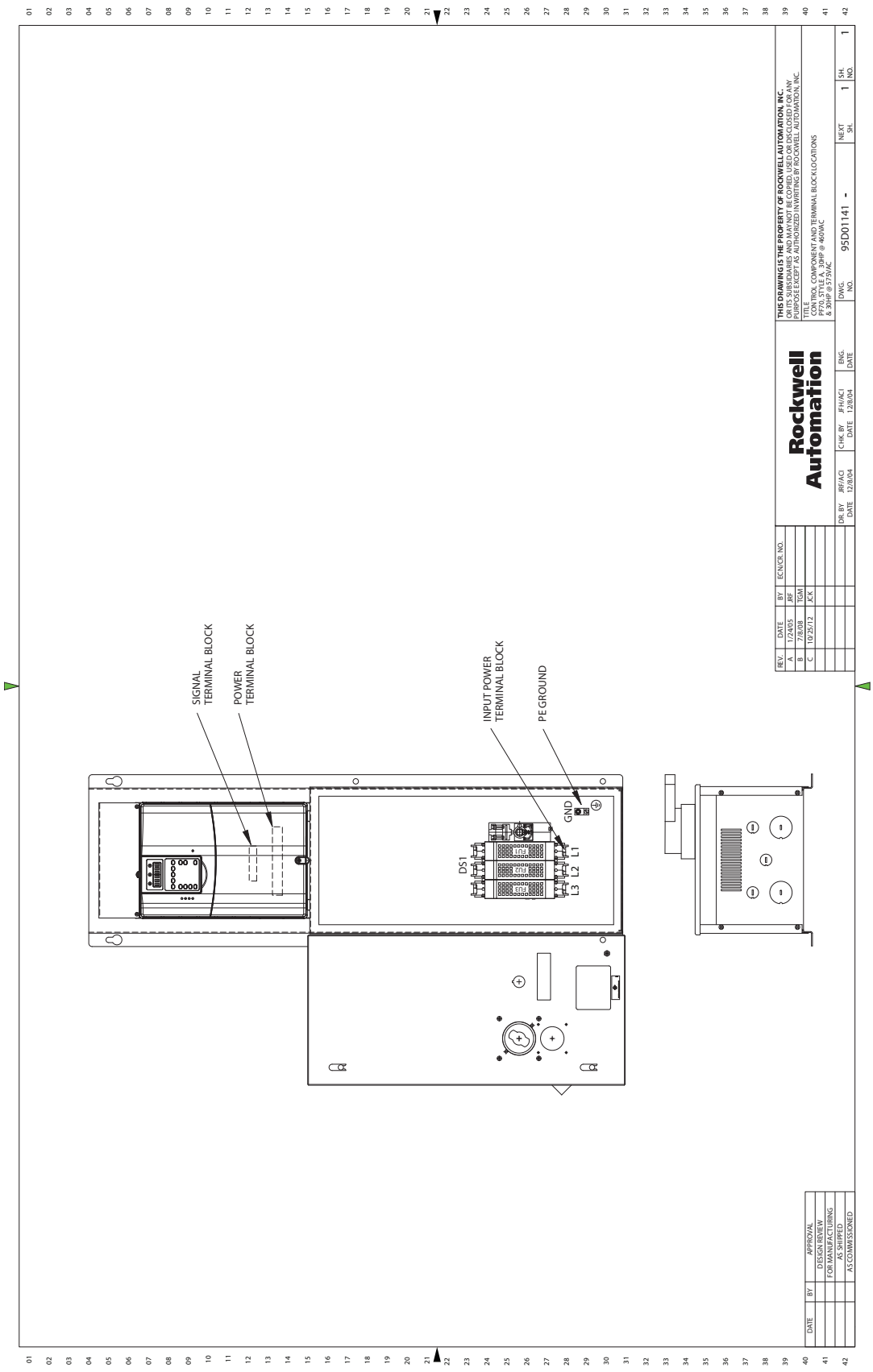


Figure 10 - 15 Hp at 208V AC; 40…50 Hp, 480V AC and 600V AC Drives

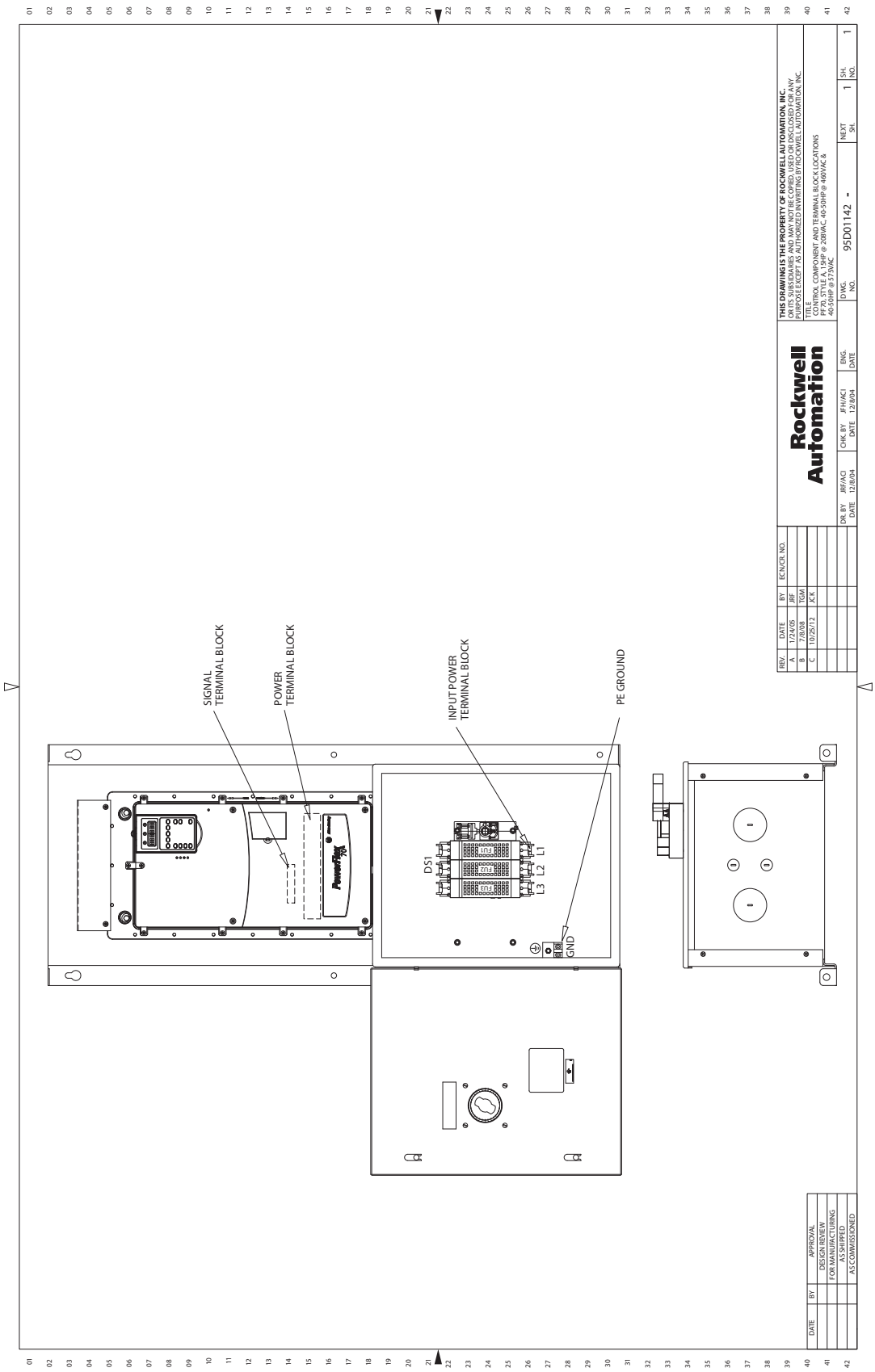


Figure 11 - 60 Hp, 480V AC and 600V AC Drives

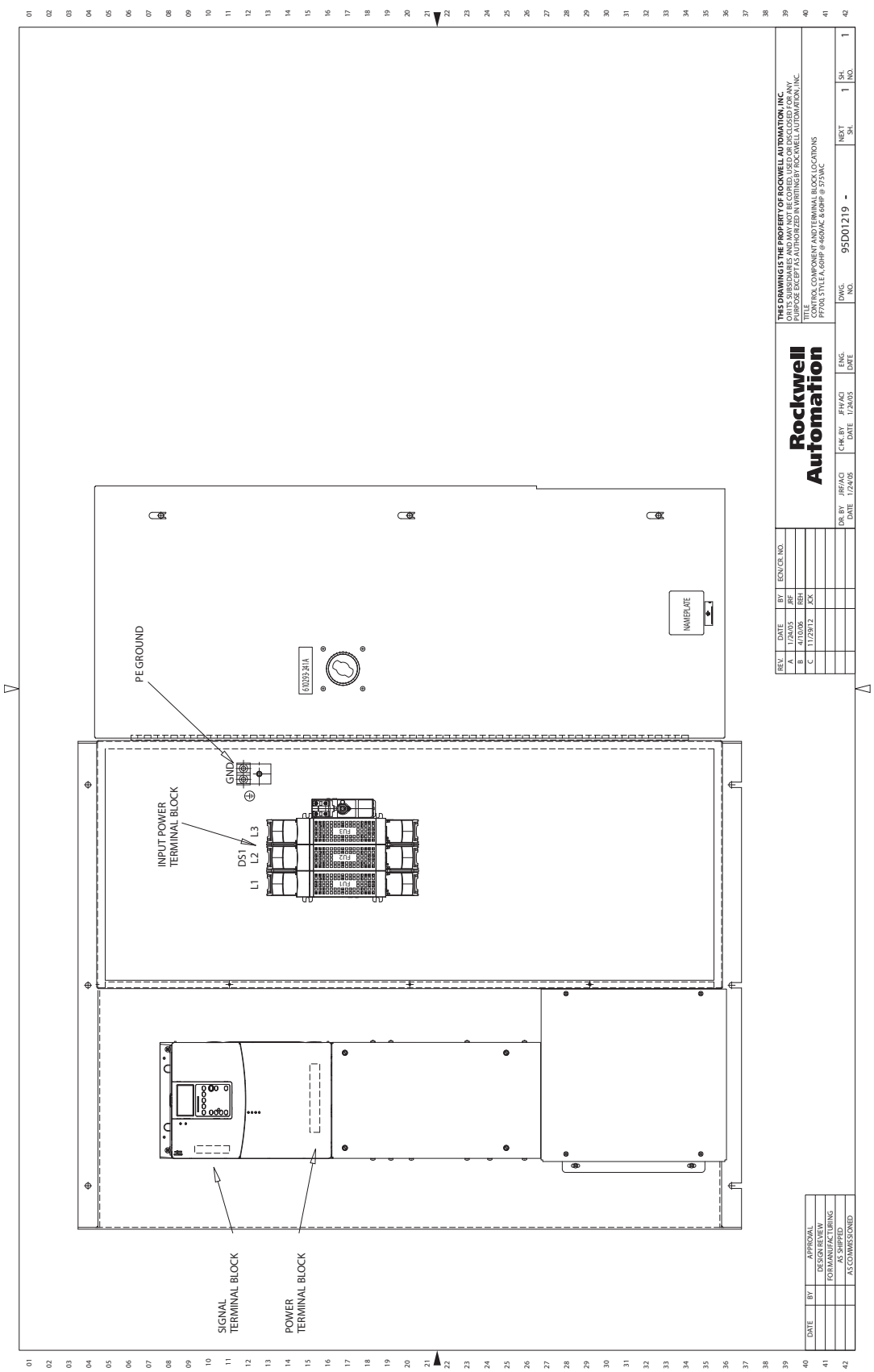


Figure 12 - 75…100 Hp, 480V AC and 600V AC Drives

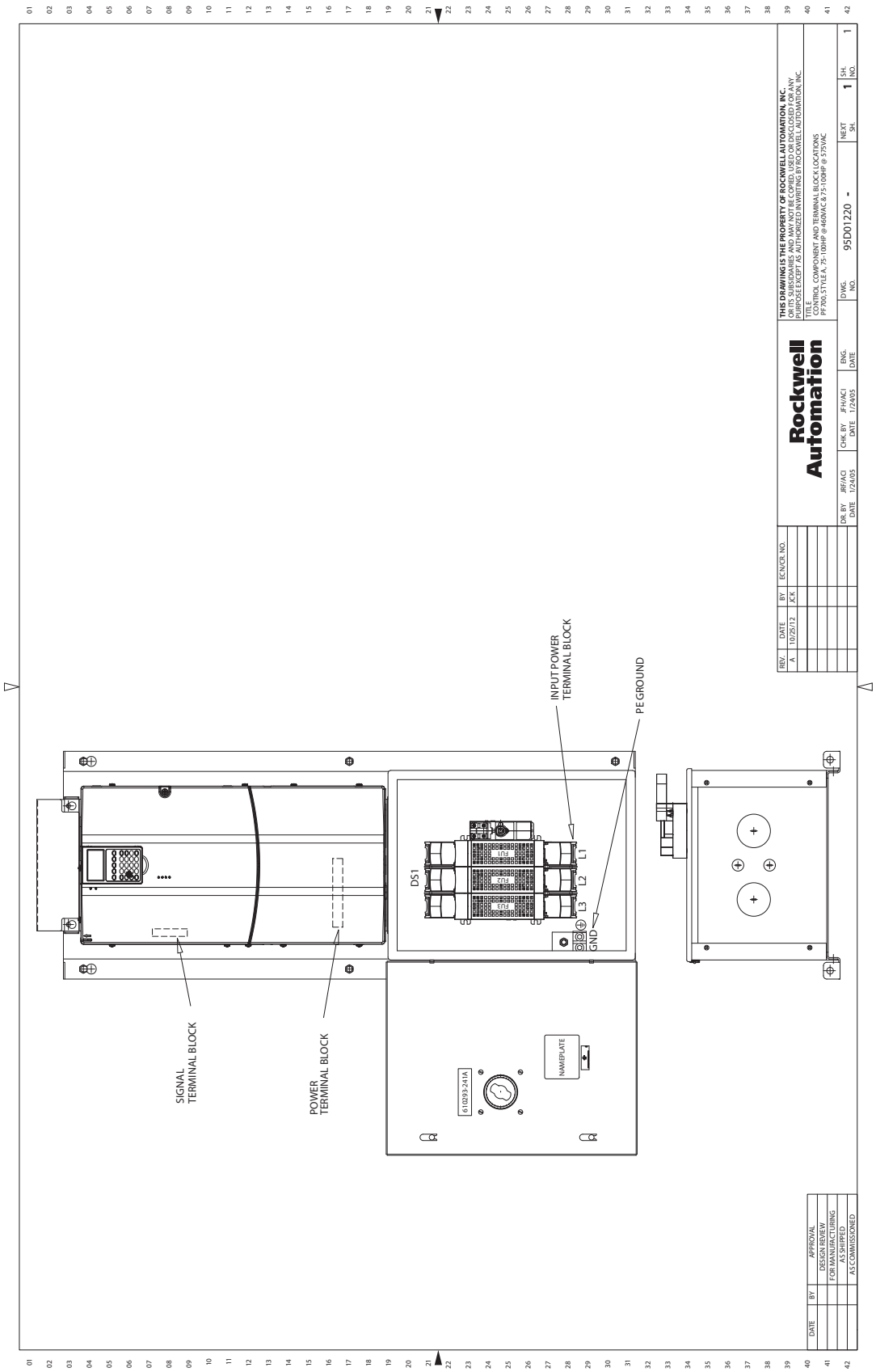


Figure 13 - 125…200 Hp, 480V AC; and 125…150 Hp, 600V AC Drives

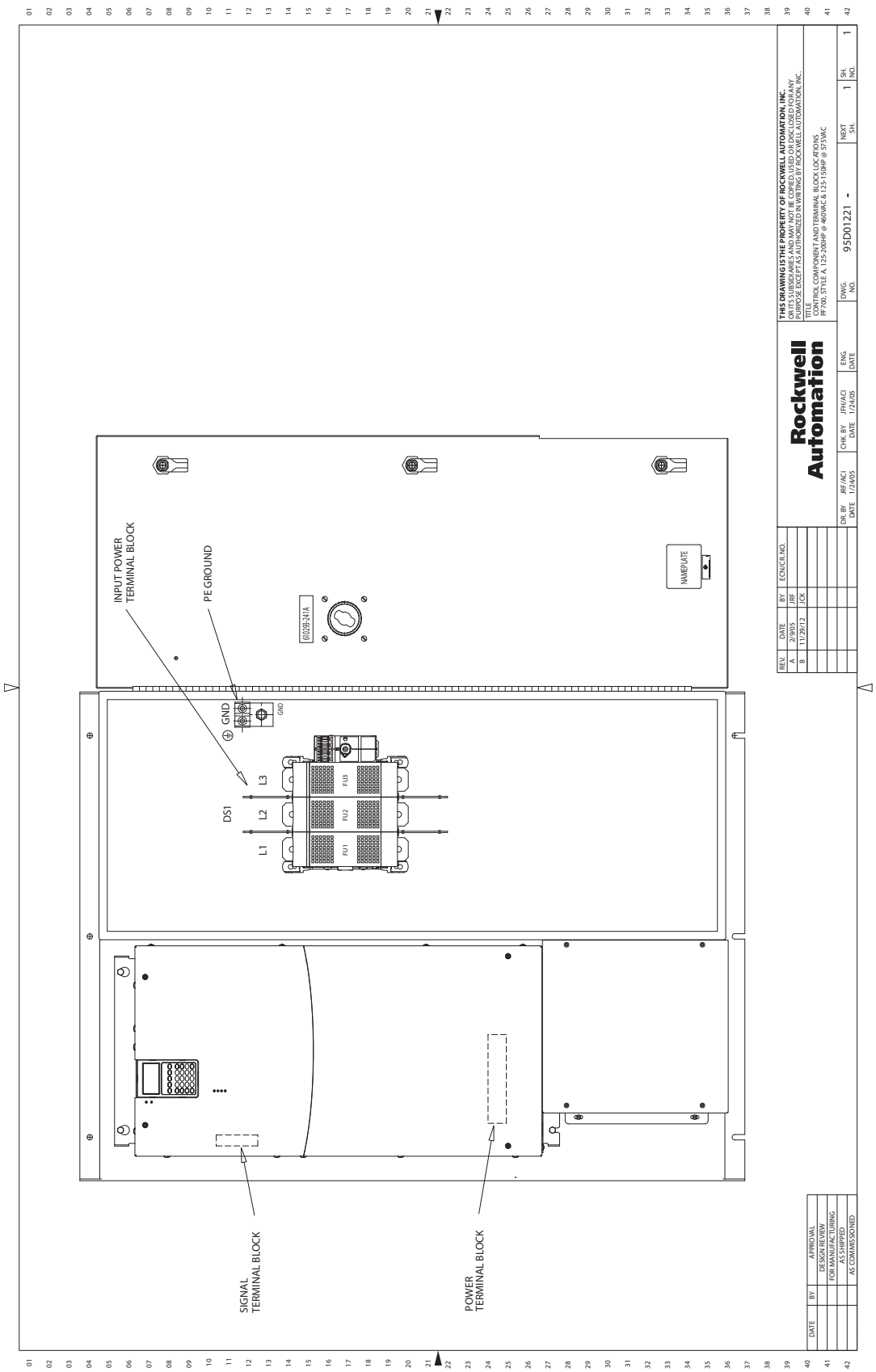


Figure 14 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 600V AC Drives with Line Reactor

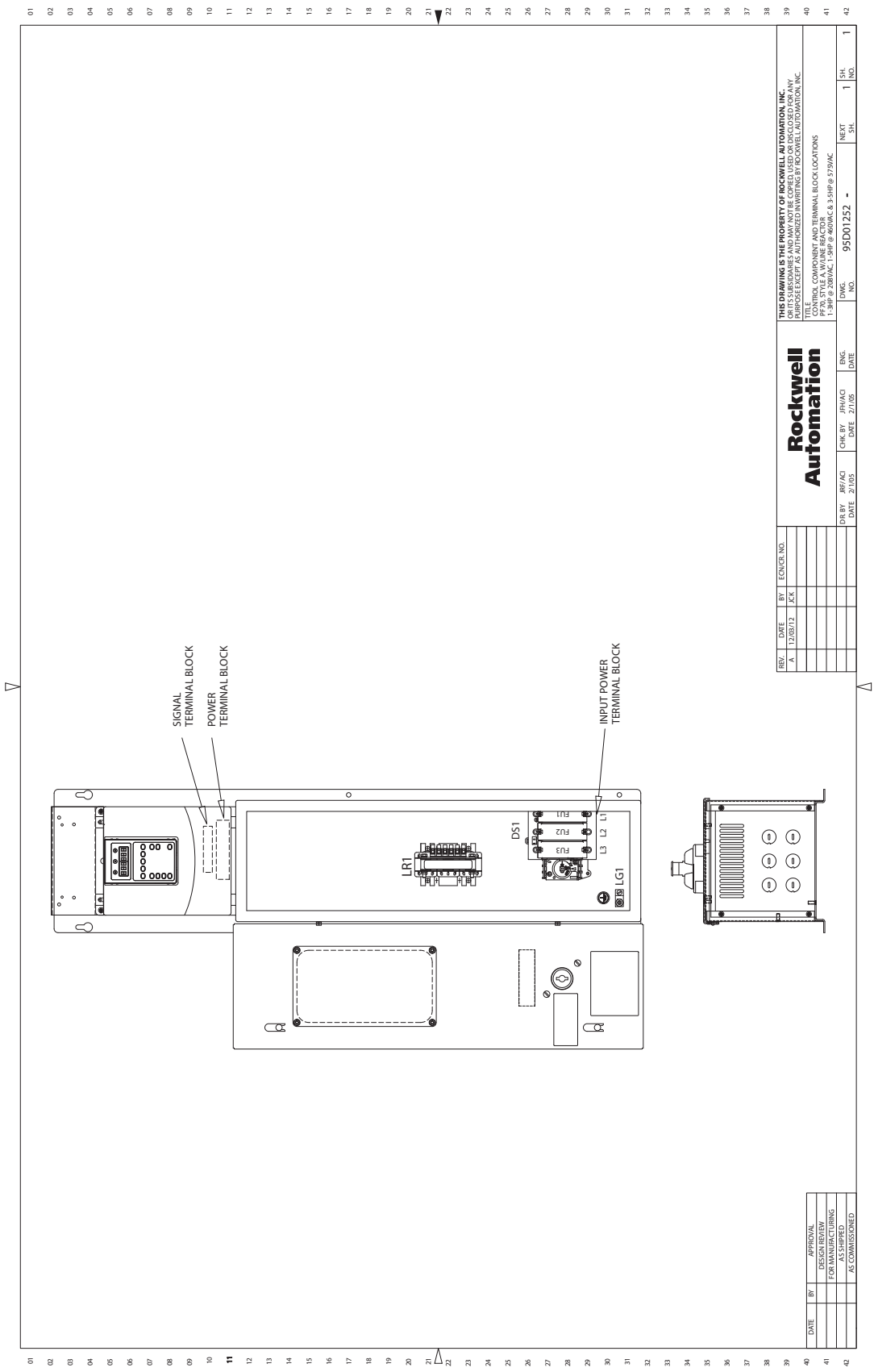


Figure 15 - 5 Hp, 208V AC; and 7.5…1 0Hp, 480V AC and 600V AC Drives with Line Reactor

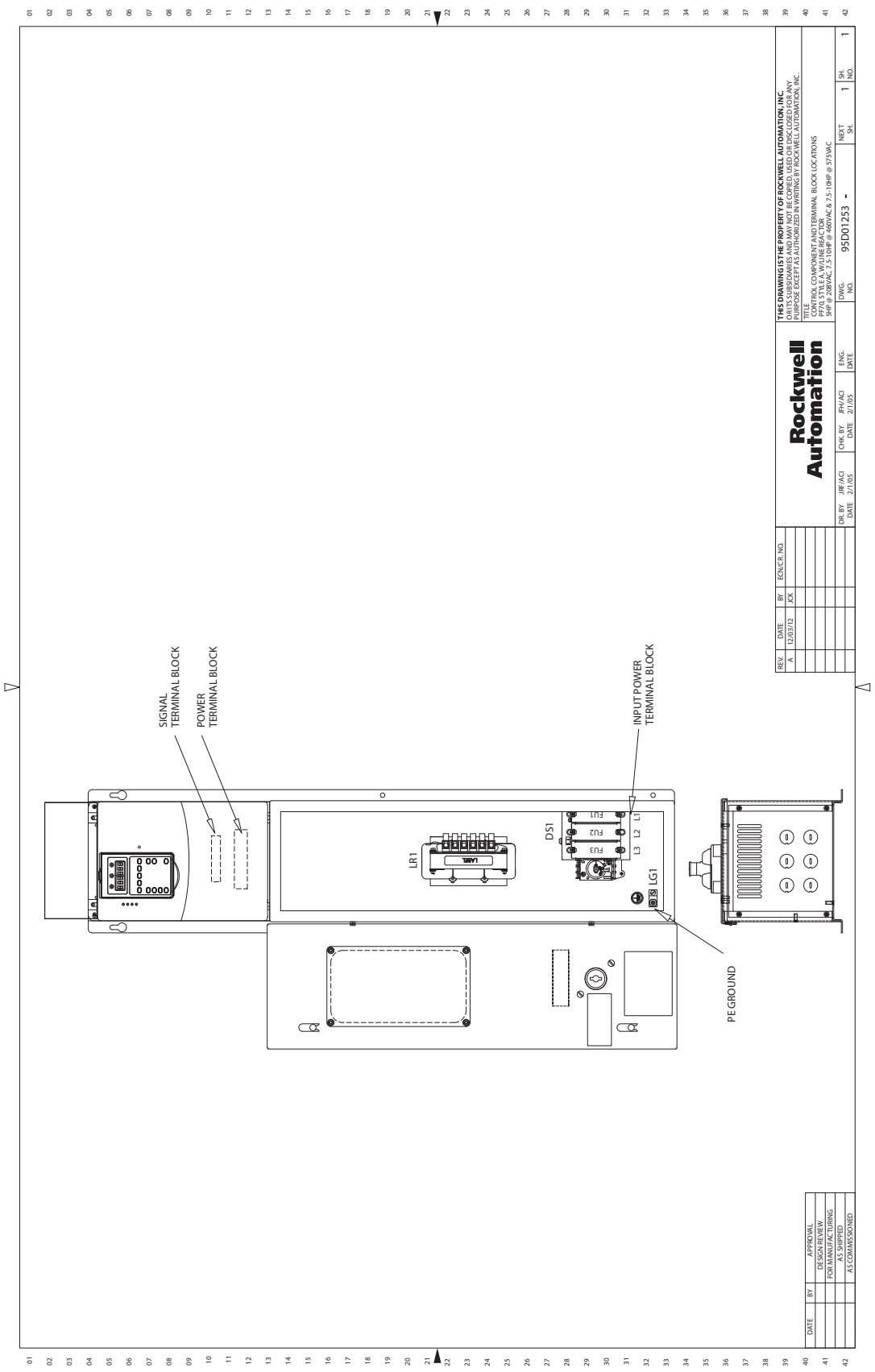
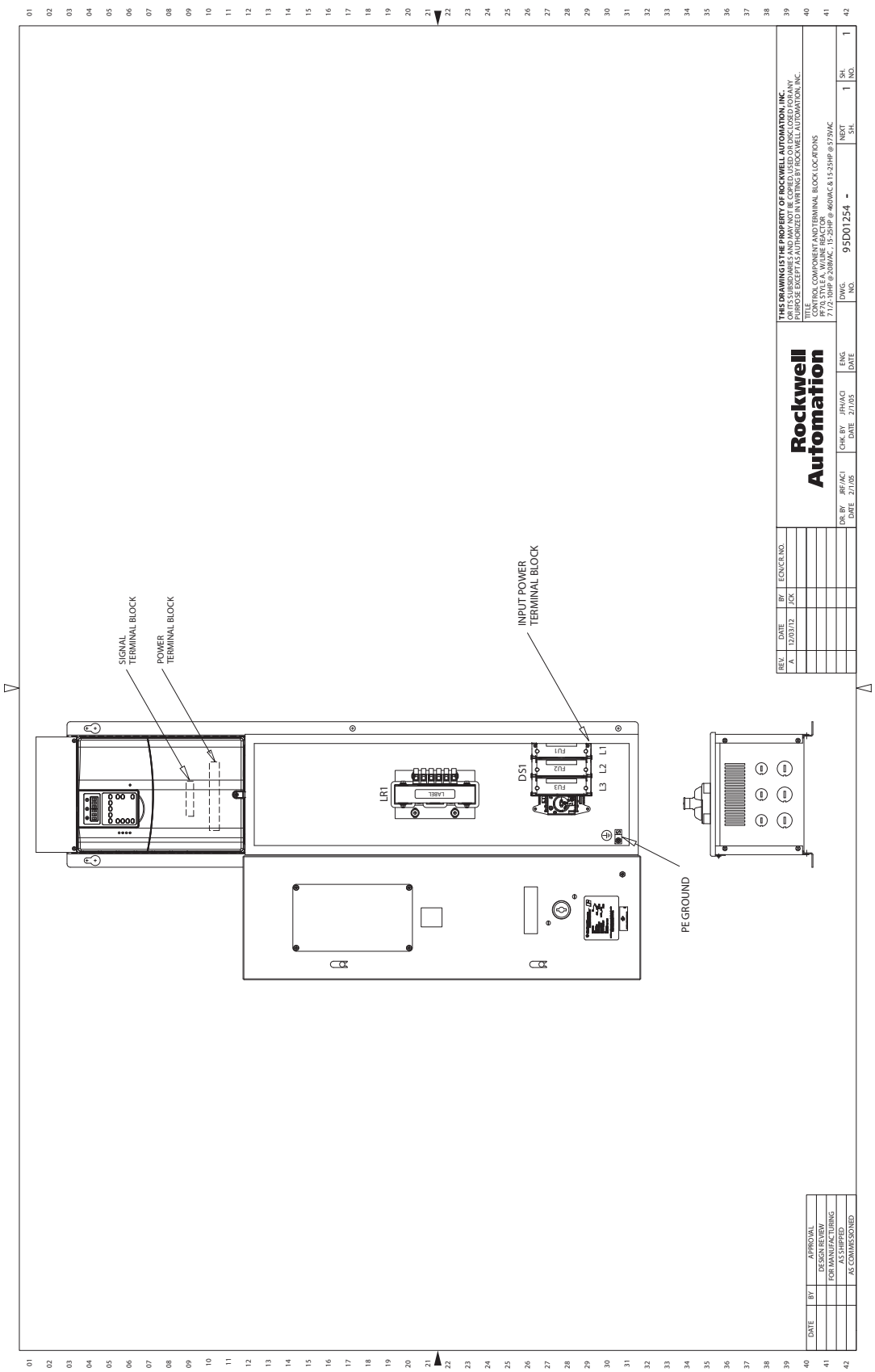


Figure 16 - 7.5…10 Hp, 208V AC; and 15…25 Hp, 480V AC and 600V AC Drives with Line Reactor



Outline Drawings

Figure 17 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 600V AC Drives

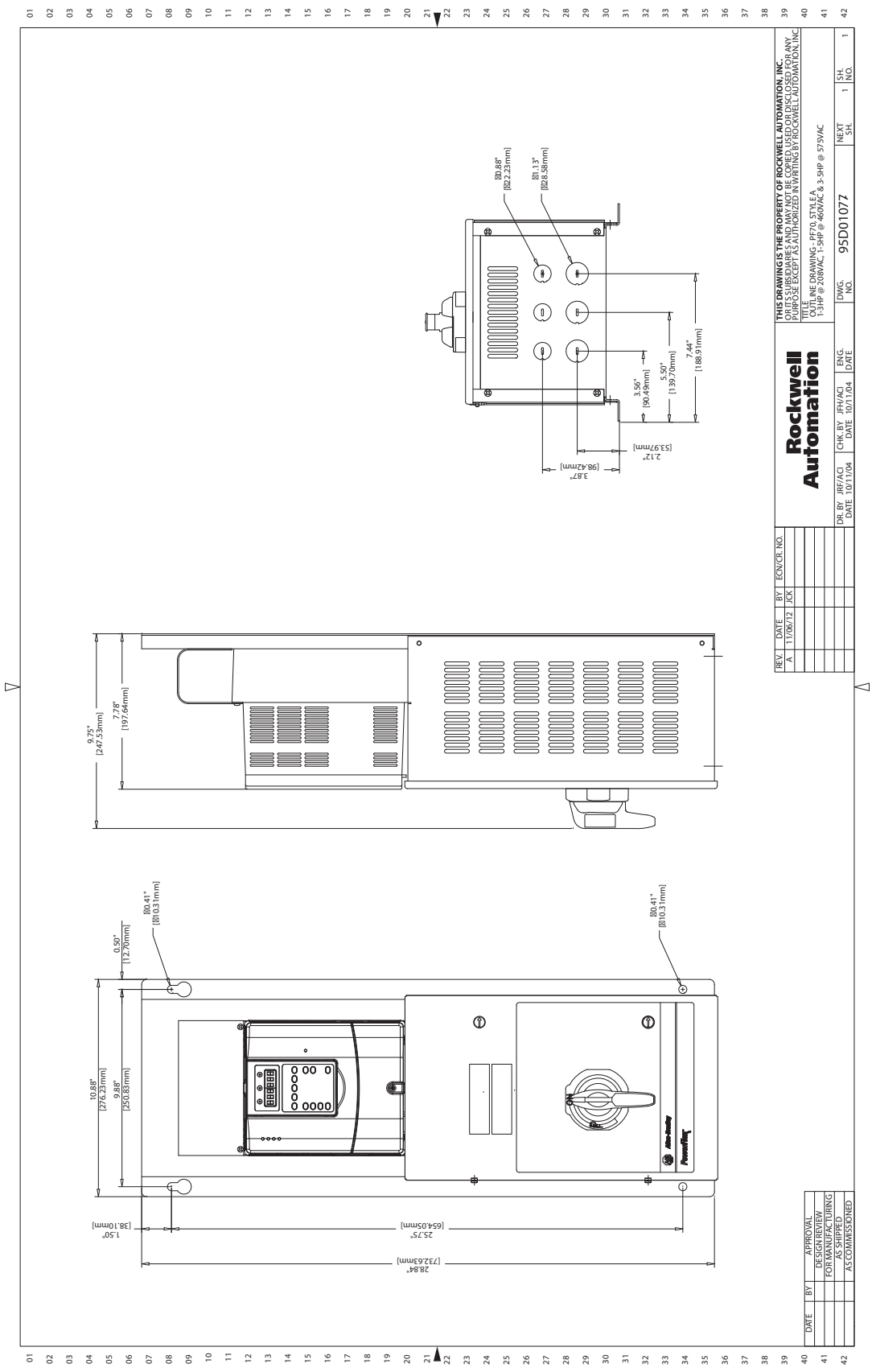


Figure 18 - 5 Hp, 208V AC; and 7.5…10 Hp, 480V AC and 600V AC Drives

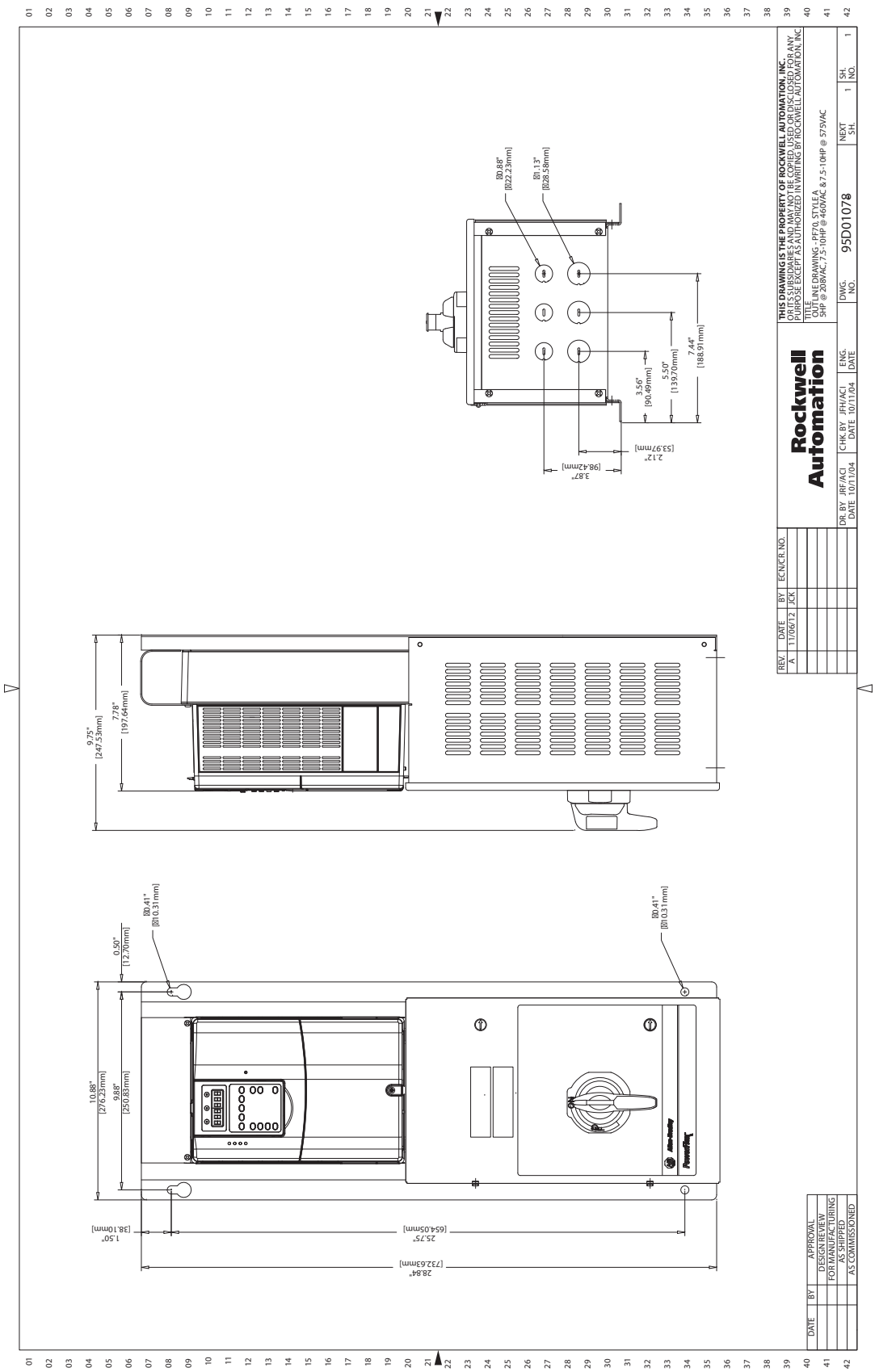


Figure 19 - 7.5…10 Hp, 208V AC; and 15…25 Hp, 480V AC and 600V AC Drives

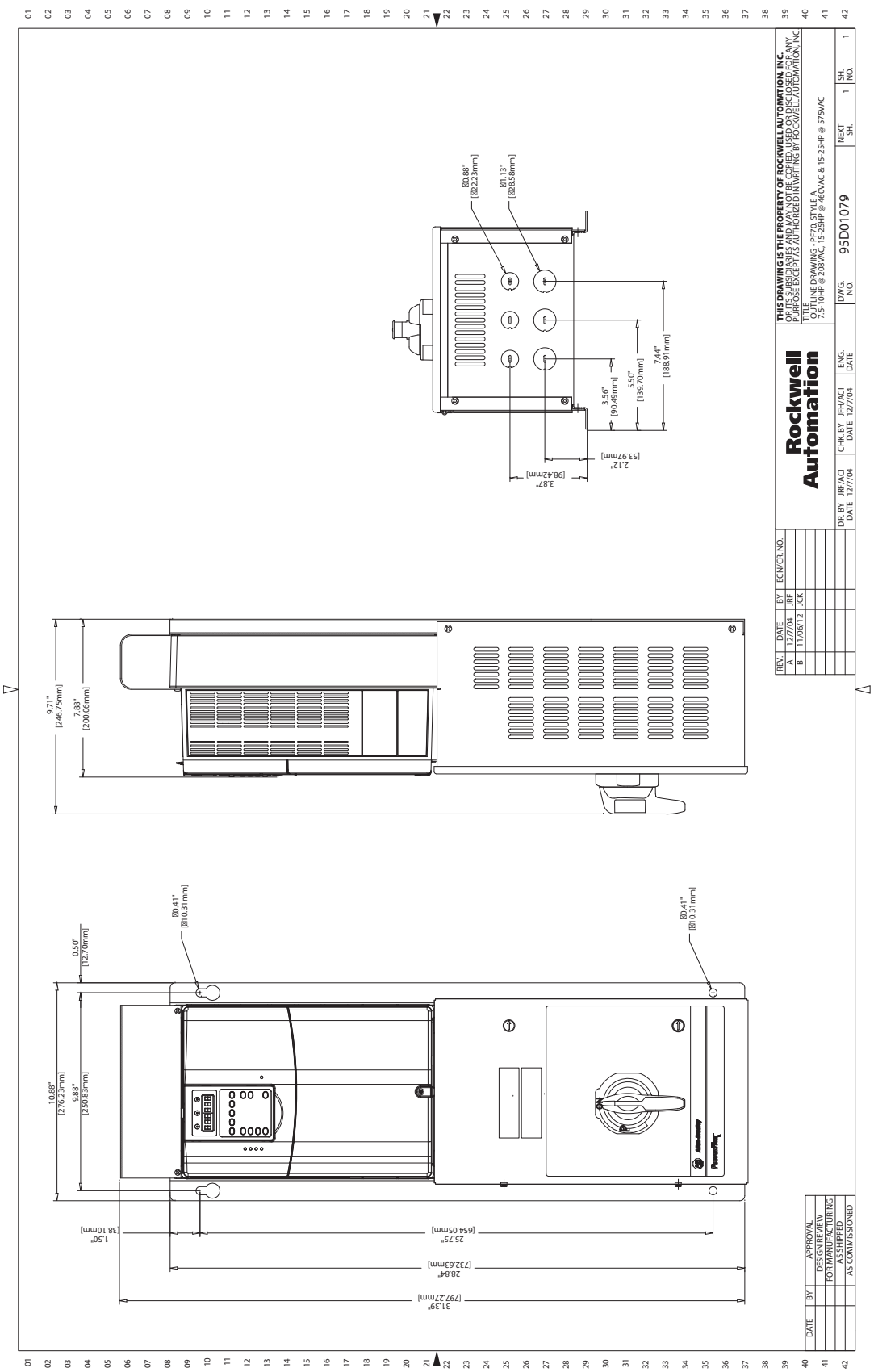


Figure 20 - 15 Hp, 208V AC; and 30 Hp, 480V AC and 600V AC Drives

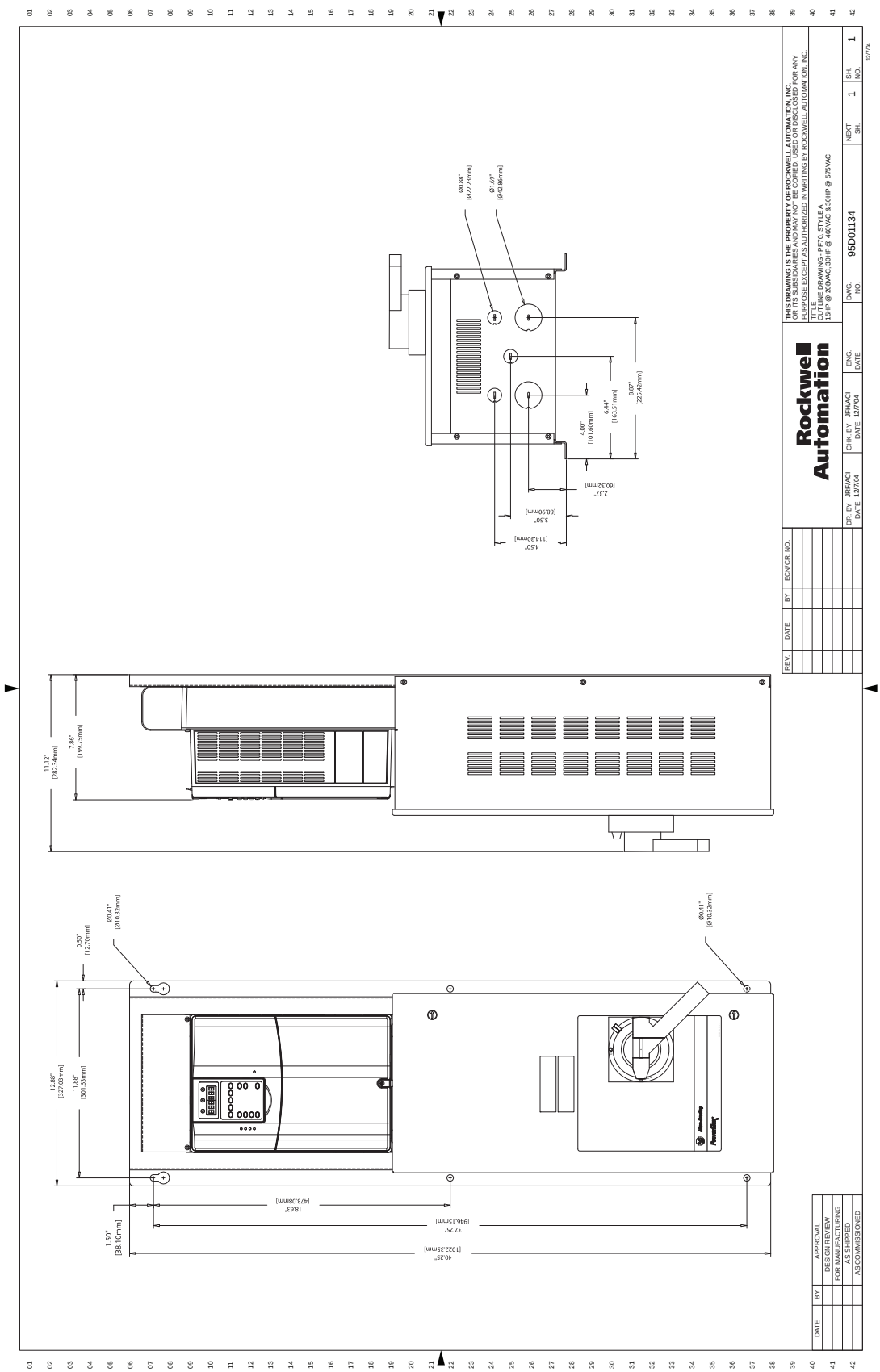


Figure 21 - 40…50 Hp, 480V AC and 600V AC Drives

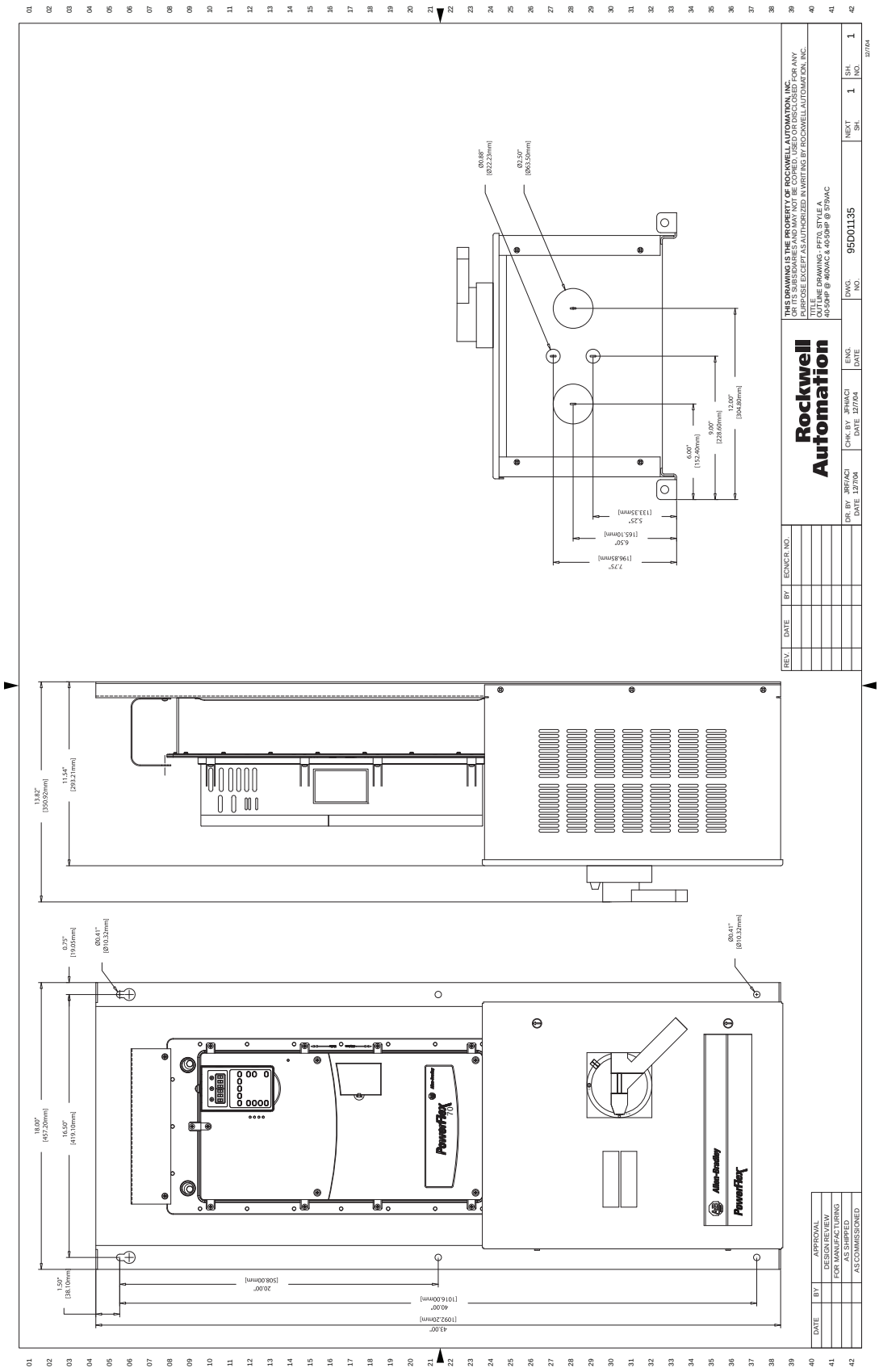


Figure 22 - 60 Hp, 480V AC and 600V AC Drives

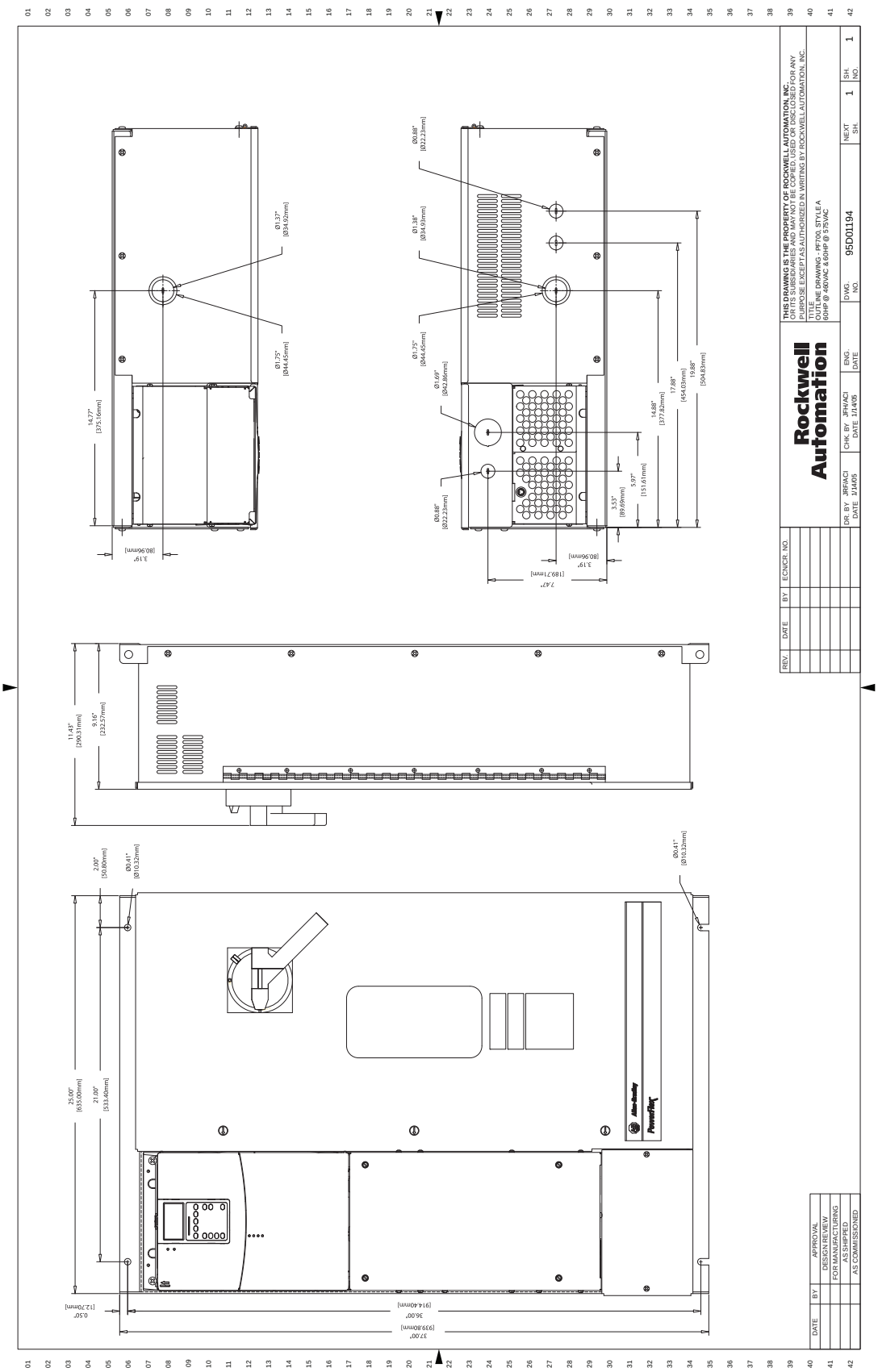


Figure 23 - 75…100 Hp, 480V AC and 600V AC Drives

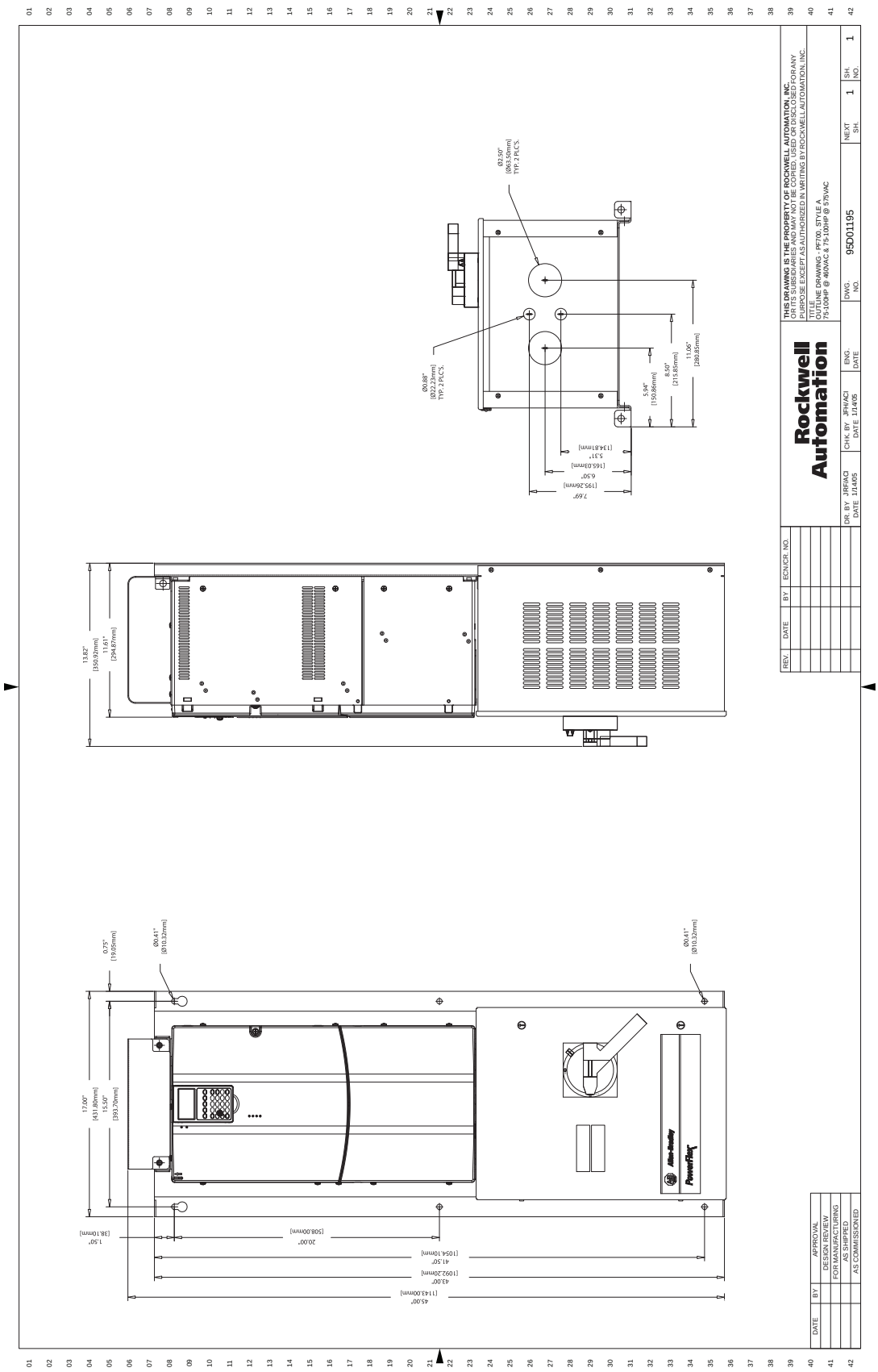


Figure 24 - 125…200 Hp, 480V AC; 125…150 Hp, 600V AC Drives

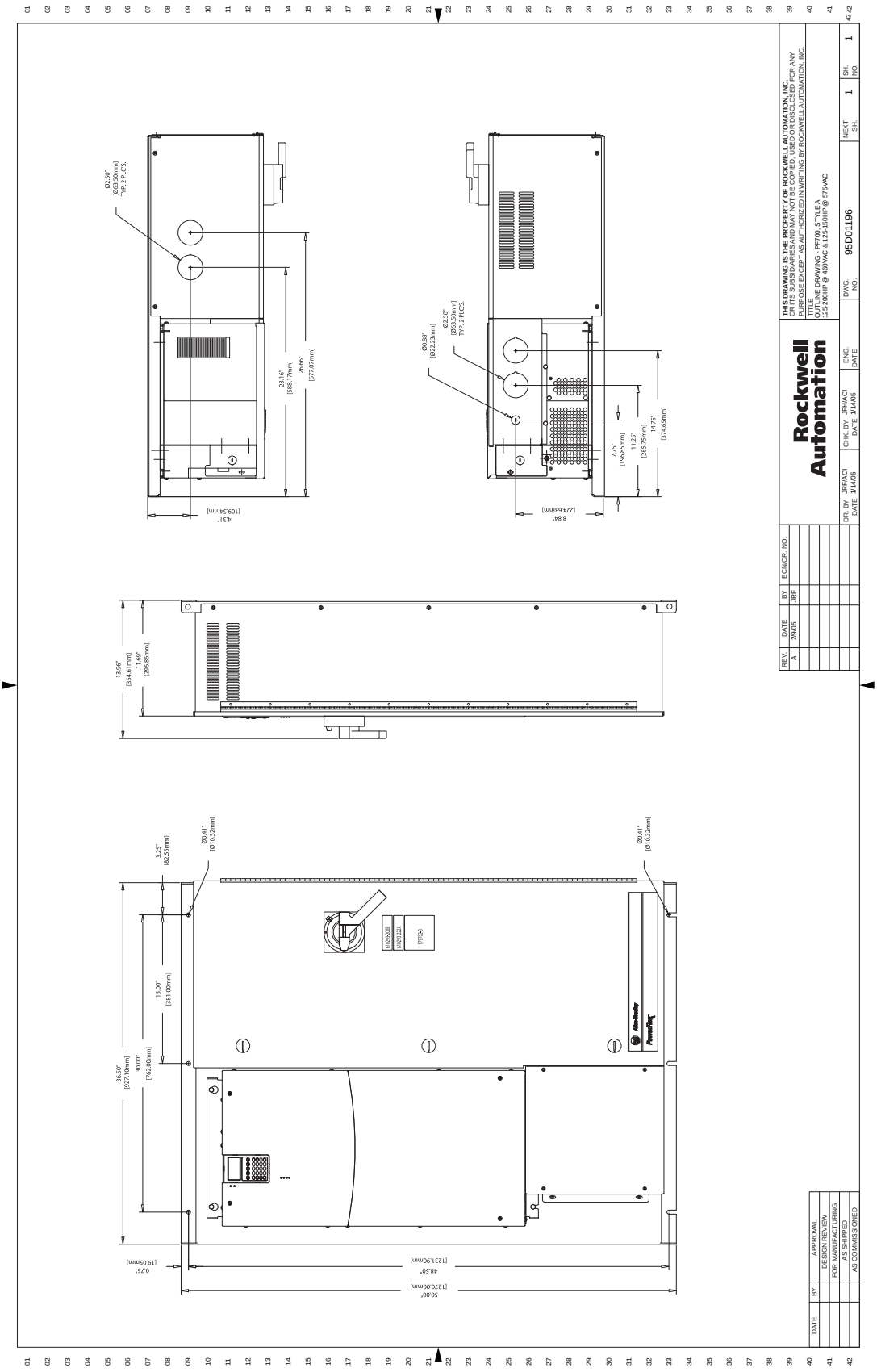


Figure 25 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 600V AC Drives with Line Reactor

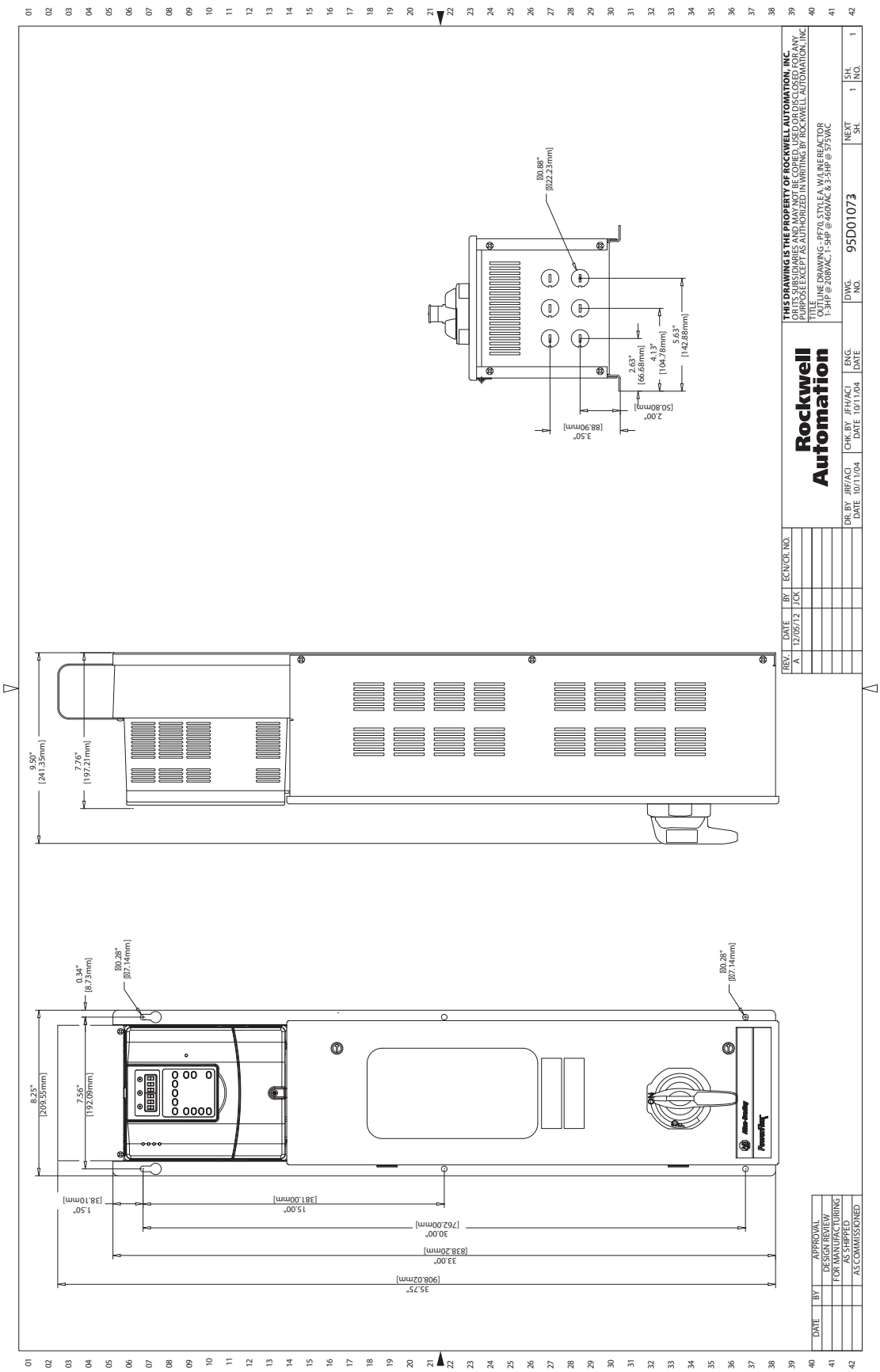


Figure 26 - 5 Hp, 208V AC; and 7.5…10 Hp, 480V AC and 600V AC Drives with Line Reactor

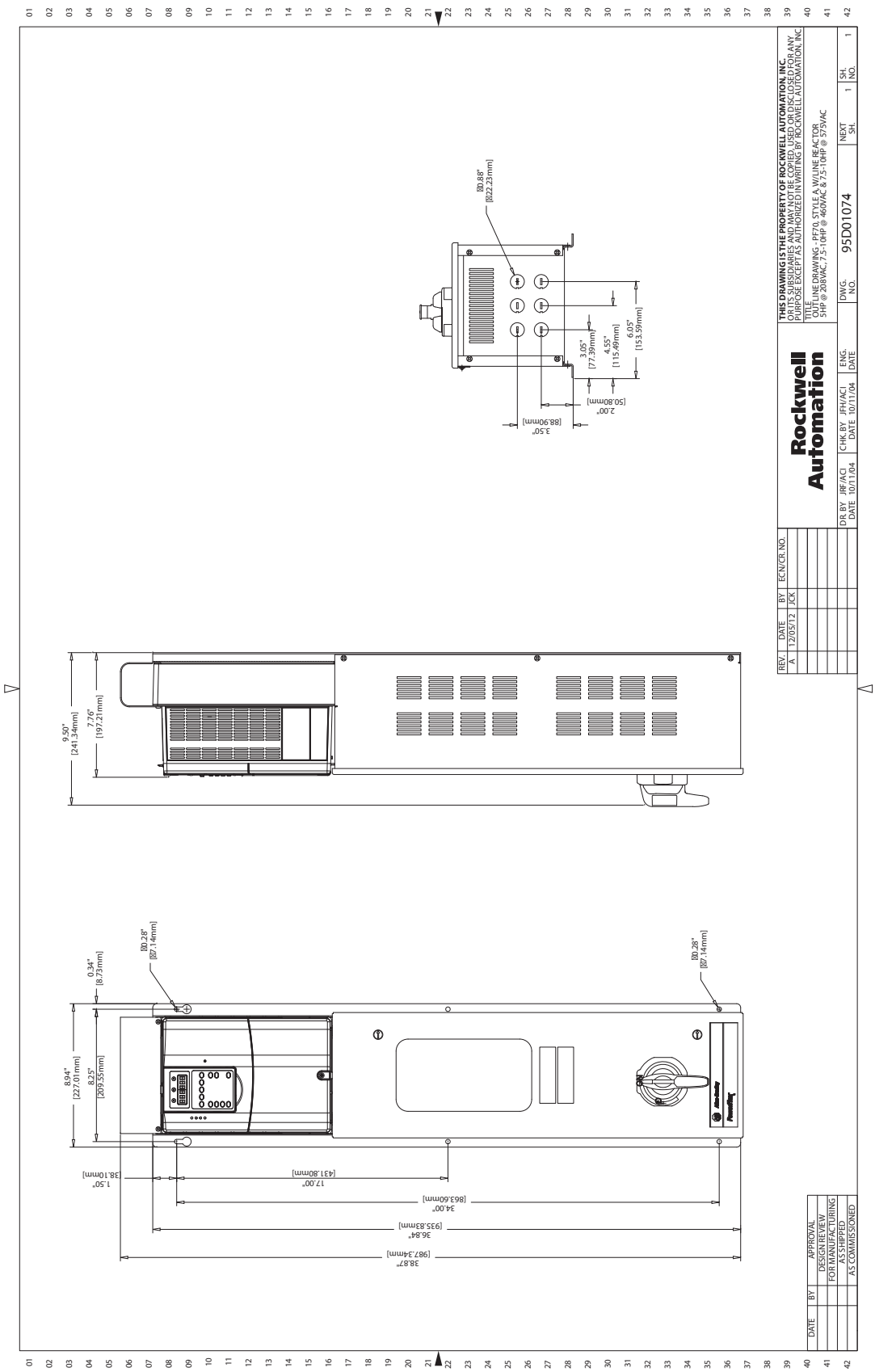
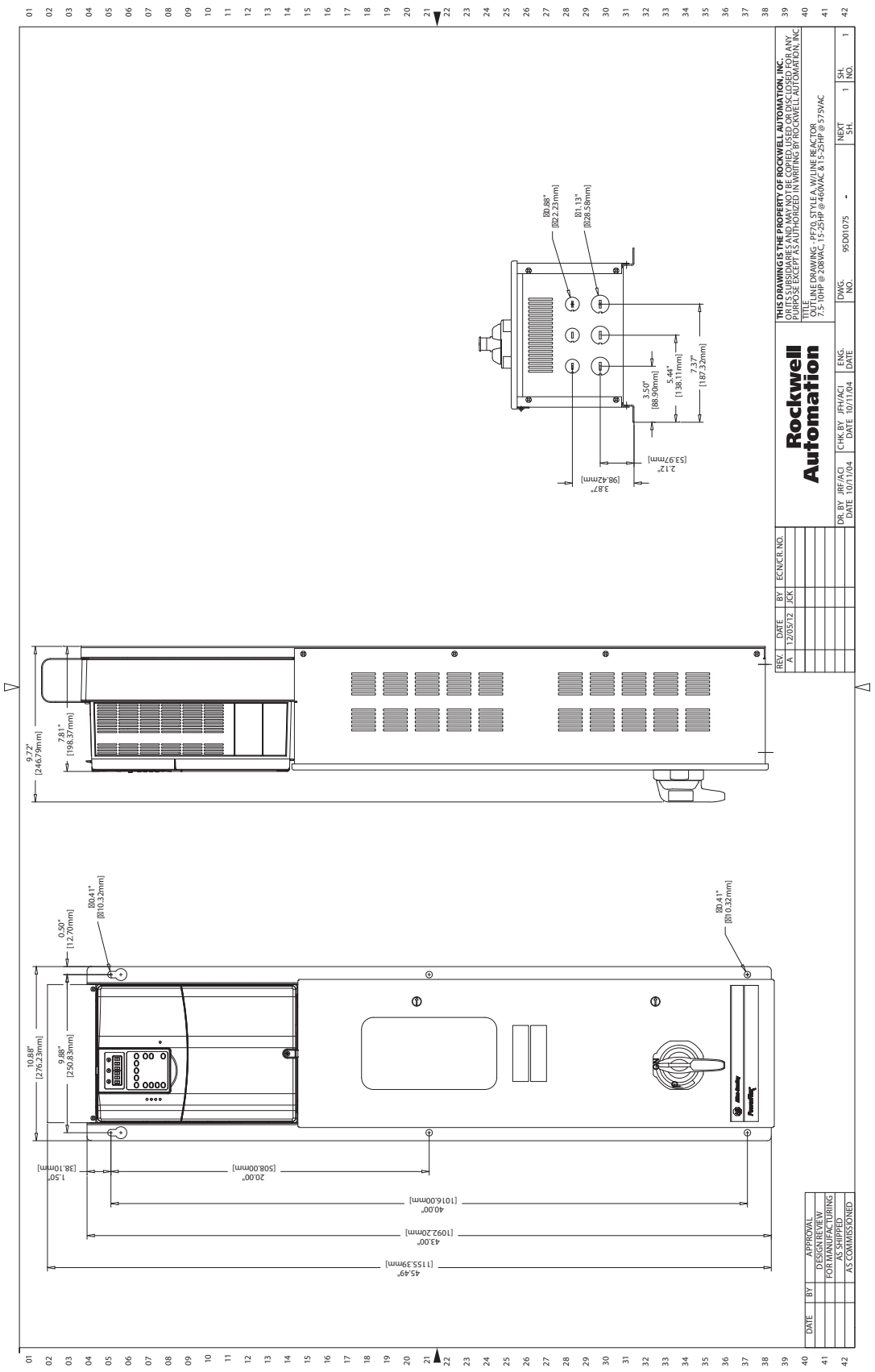


Figure 27 - 7.5…10 Hp, 208V AC; and 15…25 Hp, 480V AC and 600V AC Drives with Line Reactor



Three-contactor Full-feature Bypass with Disconnect Package (style B)

This chapter describes the features and operation for the 3-contactor full-feature bypass with disconnect package (style B).

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Inter-connect Drawings	83
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Hardware Overview

The 3-contactor full-feature bypass with disconnect package (style B) enables the motor to be manually transferred from drive output to the AC line, or from the AC line to the drive, while the motor is at zero (0) speed. The contactor bypass is electrically interlocked. A means for disconnecting input power via a door interlocked fuse disconnect switch is standard. In addition, this package is supplied with a bypass control interface that provides status indication and enables remote activation of the bypass circuit.

Main Disconnect Switch (DS1)

An Allen-Bradley Bulletin 194R fused disconnect switch with lockable rotary mounted operator handle is provided. The disconnect switch is designed to meet disconnect switch requirements for branch circuit protection. The door-mounted handle accepts up to three padlocks.

Main Fuses (FU1…FU3)

ATTENTION: Most codes require that upstream branch circuit protection be provided to protect input power wiring. Install the fuses recommended in Table 8 on page 52. Do not exceed the fuse ratings. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Input line branch circuit protection fuses must be used to protect the input power lines. If input fuses are not provided with your drive, recommended fuse values are shown in Table 8 on page 52. The input fuse ratings listed in Table 8 on page 52 are applicable for one drive per branch circuit. Do not apply other loads to the fused circuit.

The recommended fuse type for all PowerFlex 70 and 700 packages for fan and pump applications is UL Class J, 600V.

Table 8 - Fuse Recommendations

Drive Rating			Fuse Rating
Input Voltage	**kW**	**Hp**	**Amps**
208V AC, 3-phase	0.75	1.0	10
	1.5	2.0	15
	2.2	3.0	20
	4.0	5.0	20
	5.5	7.5	35
	7.5	10	40
	11	15	80
480V AC, 3-phase	0.75	1.0	6
	1.5	2.0	10
	2.2	3.0	10
	4.0	5.0	15
	5.5	7.5	20
	7.5	10	20
	11	15	35
	15	20	35
	18.5	25	60
	22	30	70
	30	40	80
	37	50	100
	45	60	150
	55	75	175
	75	100	200
	90	125	250
	110	150	350

Table 8 - Fuse Recommendations (Continued)

Drive Rating			Fuse Rating
Input Voltage	**kW**	**Hp**	**Amps**
600V AC, 3-phase	2.2	3.0	10
	4.0	5.0	15
	5.5	7.5	20
	7.5	10	20
	11	15	35
	15	20	35
	18.5	25	60
	22	30	70
	30	40	80
	37	50	100
	45	60	150
	55	75	175
	75	100	200
	90	125	250
	110	150	350

Contactors (DIC, DOC, and BC)

Allen-Bradley Bulletin 100 contactors are provided for all ratings. The contactors function as described here:

- Drive input contactor (DIC) opens and closes input to the drive.
- Drive output contactor (DOC) opens and closes the connection between the drive and the motor.
- Bypass contactor (BC) opens and closes the connection to line-start the motor.

Motor Overload Relay (OL)

The motor overload relay is set at the factory to 100% of the drive output current. In many cases, this setting matches the motor full load amps (FLA). However, before starting the drive, check the setting on the motor overload relay to be sure that it is set properly for your motor. The settings for the motor overload relay are described here:

- For motors with a service factor less than 1.15, set the motor overload relays to 0.9x motor FLA.
- For motors with a service factor equal to, or greater than 1.15, set the motor overload relay to the motor FLA.

Figure 28 - Setting Motor Overload

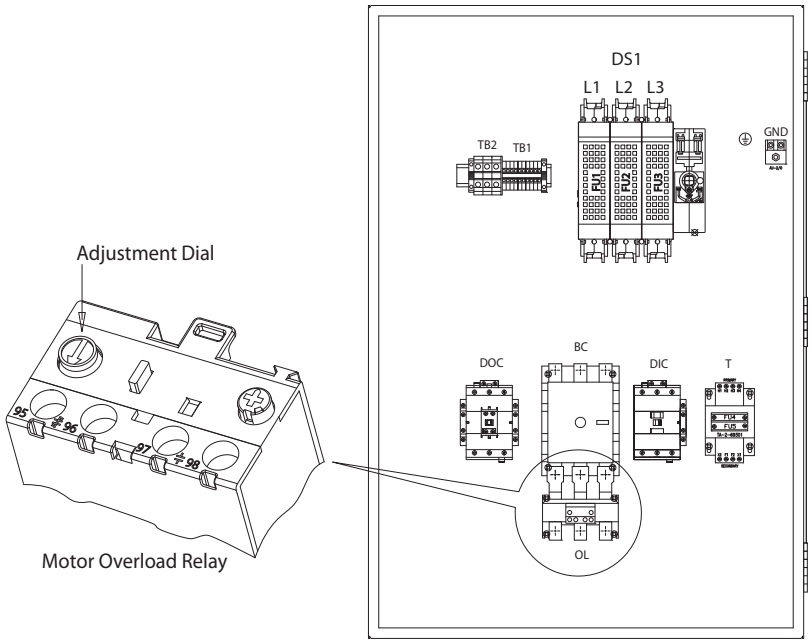


Table 9 - Overload Ratings

Drive Rating			Overload Rating	
Input Voltage	**kW**	**Hp**	**Trip Class**	**Adjustment Range (Amps)**
208V AC, 3-phase	0.75	1.0	20	3.2…16
	1.5	2.0	20	3.2…16
	2.2	3.0	20	3.2…16
	4.0	5.0	20	5.4…27
	5.5	7.5	20	9…45
	7.5	10	20	9…45
	11	15	20	18…90

Table 9 - Overload Ratings (Continued)

Drive Rating			Overload Rating	
Input Voltage	**kW**	**Hp**	**Trip Class**	**Adjustment Range (Amps)**
480V AC, 3-phase	0.75	1.0	20	1.0…5.0
	1.5	2.0	20	1.0…5.0
	2.2	3.0	20	3.2…16
	4.0	5.0	20	3.2…16
	5.5	7.5	20	3.2…16
	7.5	10	20	5.4…27
	11	15	20	9…45
	15	20	20	9…45
	18.5	25	20	9…45
	22	30	20	9…45
	30	40	20	18…90
	37	50	20	18…90
	45	60	20	18…90
	55	75	20	40…200
	75	100	20	40…200
	90	125	20	40…200
	110	150	20	40…200
600V AC, 3-phase	2.2	3.0	20	3.2…16
	4.0	5.0	20	3.2…16
	5.5	7.5	20	3.2…16
	7.5	10	20	5.4…27
	11	15	20	9…45
	15	20	20	9…45
	18.5	25	20	9…45
	22	30	20	9…45
	30	40	20	18…90
	37	50	20	18…90
	45	60	20	18…90
	55	75	20	40…200
	75	100	20	40…200
	90	125	20	40…200
	110	150	20	40…200

Control Transformer (T1)

115V AC control power is obtained via a supplied control power transformer. The control transformer is fused on the primary.

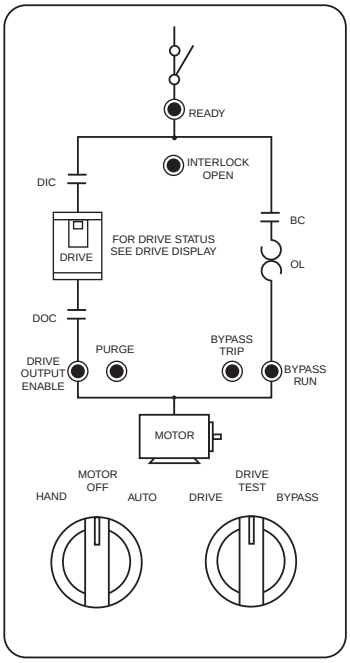
Bypass Control Interface (CP1)

The operator interface on the bypass option box shows the following status indicators:

- READY (green) – On when power is applied to the drive-bypass unit.
- INTERLOCK OPEN (amber) – On when the customer interlock or Aux Fault is de-energized.
- BYPASS RUN (green) – On when the bypass contactor (BC) is energized.
- BYPASS TRIP (red) – On when a bypass fault condition exists (for example, bypass motor overload has tripped).
- PURGE (amber) – On when the purge condition is active.
- DRIVE OUTPUT ENABLE (Green) – On when the drive output contactor (DOC) is energized.

In addition, the bypass control interface contains two selector switches. Selector switch 1 (SS1) determines the state of the DIC, DOC, and BC contactors. Selector switch 2 (SS2) determines the source of control logic.

Figure 29 - Bypass Control Interface



Electrical Installation

Input Power Wiring

Refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about input power wiring recommendations and selection.

ATTENTION: Protect the contents of the options cabinet from metal chips and other debris while making the conduit openings. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

ATTENTION: Do not route signal and control wiring with power wiring in the same conduit. This can cause interference with drive operation. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Follow these steps to connect AC input power to the drive package.

1. Select the proper wire size according to NEC and all applicable local codes and standards. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. Power terminal block specifications are listed in Table 10 on page 57.
2. Connect the three-phase AC input power leads (three-wire VAC) to the appropriate terminals. Connect the AC input power leads to terminals L1, L2, and L3 on the fused disconnect switch.
3. Tighten the AC input terminal power terminals to the proper torque according to drive type as shown in Table 10 on page 57.

Table 10 - AC Input Power Terminal Block Specifications

Voltage Rating	kW	Hp	Maximum Wire Size(1) mm² (AWG)	Minimum Wire Size mm² (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…3.7	1…5	10.0 (8)	2.5 (14)	1.6 (14)
	5.5…7.5	7.5…10	25 (4)	2.5 (14)	2.8 (25)
	11	15	50 (1)	4.0 (12)	4.0 (35.4)
480V AC	0.75…7.5	1…10	10.0 (8)	2.5 (14)	1.6 (14)
	11…18.5	15…25	25 (4)	2.5 (14)	2.8 (25)
	22…37	30…50	50 (1)	4.0 (12)	4.0 (35.4)
	45…75	60…100	150 (300 MCM)	16 (6)	22.5 (200)
	90…110	125…150	2 x 185 (350 MCM)	2 x 16 (6)	45.0 (398)
600V AC	0.75…7.5	1…10	10.0 (8)	2.5 (14)	1.6 (14)
	11…18.5	15…25	25 (4)	2.5 (14)	2.8 (25)
	22…37	30…50	50 (1)	4.0 (12)	4.0 (35.4)
	45…75	60…100	150 (300 MCM)	16 (6)	22.5 (200)
	90…110	125…150	2 x 185 (350 MCM)	2 x 16 (6)	45.0 (398)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

Output Power Wiring

Refer to the PowerFlex 70 AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about output power wiring recommendations and selection.

ATTENTION: Unused wires in conduit must be grounded at both ends to avoid a possible shock hazard caused by induced voltages. Also, if a drive sharing a conduit is being serviced or installed, all drives using this conduit must be disabled to eliminate the possible shock hazard from cross-coupled motor leads. Failure to observe these precautions could result in bodily injury.

ATTENTION: Do not route signal and control wiring with power wiring in the same conduit. This can cause interference with drive operation. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

Follow these steps to connect AC output power wiring from the drive to the motor.

1. Wire the three-phase AC output power motor leads by routing them according to the drive option type. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. Output power terminal block specifications are listed in Table 11 on page 59.

   Do not route more than three sets of motor leads through a single conduit. This minimizes cross-talk that could reduce the effectiveness of noise reduction methods. If more than three drive/motor connections per conduit are required, shielded cable must be used. If possible, each conduit must contain only one set of motor leads.

2. Connect the three-phase AC output power motor leads to terminals T1, T2, and T3 on the output power terminal block (TB2) inside the option cabinet.

3. Tighten the three-phase AC output power terminals to the proper torque according to drive type as shown in Table 11 on page 59 on the following page.

Table 11 - Output Power Terminal Block Specifications

Voltage Rating	kW	Hp	Maximum Wire Size[1] mm^2 (AWG)	Minimum Wire Size mm^2 (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…5.5	1…7.5	10.0 (8)	0.34 (22)	1.4 (13)
	7.5…11	10…15	25 (4)	2.5 (14)	2.2 (20)
480V AC	0.75…5.5	1…15	10.0 (8)	0.34 (22)	1.4 (13)
	7.5…22	20…30	25 (4)	2.5 (14)	2.2 (20)
	30…55	40…75	35 (2)	2.5 (14)	5.7 (51)
	75	100	2 x 185 (350 MCM)	2 x 16 (6)	31 (275)
	90…110	125…150	2 x 185 (350 MCM)	2 x 16 (6)	31 (275)
600V AC	2.2…5.5	3…15	10.0 (8)	0.34 (22)	1.4 (13)
	7.5…22	20…30	25 (4)	2.5 (14)	2.2 (20)
	30…55	40…75	35 (2)	2.5 (14)	5.7 (51)
	75	100	2 x 185 (350 MCM)	2 x 16 (6)	31 (275)
	90…110	125…150	2 x 185 (350 MCM)	2 x 16 (6)	31 (275)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

Control and Signal Wiring

Refer to the PowerFlex 70 AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for additional detailed information about control and signal wiring.

The I/O terminal block on the drive, and the control terminal block (TB1 terminals 31...40) inside the option cabinet, provide terminals for interfacing customer-supplied control inputs and outputs. All analog and discrete control wiring is made at these terminals. Table 12 on page 59 matches the I/O terminal blocks with the drive horsepower and voltage ratings.

Table 12 - I/O Terminal Blocks

I/O Terminal Blocks	Drive Rating
Terminals 1…26	1…20 Hp at 208V AC 1…50 Hp at 480V AC 1…50 Hp at 600V AC
Terminals 1…32	60…150 Hp at 480V AC 60…50 Hp at 600V AC

Typical customer control and signal wiring is shown on the inter-connect drawings, Figure 42 on page 83, Figure 43 on page 84 and Figure 44 on page 85.

Follow these steps to connect control and signal wiring to the drive package.

1. Wire the control and signal leads by routing them according to the drive option type. You must make openings in the option cabinet of the desired conduit size, following NEC and all applicable local codes and standards. Control and signal terminal block specifications are listed in Table 13 on page 60.

   Control and signal wires must be separated from power wires by at least 0.3 m (1 ft).

2. Connect the analog and relay output signal wiring to the I/O terminal block on the drive.
3. Connect the control wiring listed below to terminals 31...40 inside the option cabinet.
   - Interlock
   - Freeze/Fire Stats
   - Autostart
   - Bypass
   - Purge
   - Bypass Running
4. Tighten the control and signal terminals to the proper torque according to drive type as shown in Table 13 on page 60.

Table 13 - I/O Terminal Block Specifications

Voltage Rating	kW	Hp	Terminals	Location	Maximum Wire Size(1) mm^2 (AWG)	Minimum Wire Size mm^2 (AWG)	Recommended Torque N•m (lb•in)
208V AC	0.75…11	1…15	1…26	Drive	1.5 (16)	0.05 (30)	0.5 (4.4)
			31…40	Option Cabinet	6.0 (10)	0.34 (22)	0.6 (5.0)
480V AC	0.75…37	1…50	1…26	Drive	1.5 (16)	0.05 (30)	0.5 (4.4)
			31…40	Option Cabinet	6.0 (10)	0.34 (22)	0.6 (5.0)
	45…110	60…150	1…32	Drive	2.5 (14)	0.34 (22)	0.6 (5.2)
			31…40	Option Cabinet	6.0 (10)	0.34 (22)	0.6 (5.0)
600V AC	0.75…137	1…50	1…26	Drive	1.5 (16)	0.05 (30)	0.5 (4.4)
			31…40	Option Cabinet	6.0 (10)	0.34 (22)	0.6 (5.0)
	45…110	60…150	1…32	Drive	2.5 (14)	0.34 (22)	0.6 (5.2)
			31…40	Option Cabinet	6.0 (10)	0.34 (22)	0.6 (5.0)

(1) Maximum/minimum sizes that the terminal block accepts - these are not recommendations. If national or local codes require sizes outside the range, lugs can be used.

Customer Connections

The 3-contactor full-feature bypass with disconnect package is set up to accommodate the following customer-supplied contacts. Contacts must be rated for 120V AC.

Interlock

The “Interlock” input functions as an enable input when operating in either Drive or Bypass Mode. Opening the “Interlock” input (T31 and T32) prevents the drive/motor from running. T31 and T32 are shipped with a jumper wire installed from the factory. If you want to use the “Interlock” input, remove the jumper wire, and wire appropriately for the customer contacts being used. If a valid “Autostart” or “Bypass” contact is present, the drive/motor immediately runs upon the closing of the “Interlock” input.

Freeze/Fire Stat

The “Freeze/Fire Stat” input functions as a system fault input when operating in either Drive or Bypass Mode. Opening the “Freeze/Fire Stat” input (T31 and T33) prevents the drive/motor from running. T31 and T33 are shipped with a jumper wire installed from the factory. If you want to use the “Freeze/Fire Stat” input, remove the jumper wire, and wire appropriately for the customer contacts being used. If the “Freeze/Fire Stat” input opens while operating in Drive Mode, the drive faults and requires a manual reset to restart once the input closes. If the “Freeze/Fire Stat” input opens while operating in Bypass Mode, the motor coasts to a stop and immediately runs when the input closes.

Autostart

The “Autostart” input is used to remotely start the drive when SS1 is in the DRIVE position and SS2 is in the AUTO position. A closed input to terminals 34 and 35 starts the drive.

Bypass

The “Bypass” input is used to remotely start the motor across the 3-phase AC line when SS1 is in the BYPASS position and SS2 is in the AUTO position. A closed input to terminals 34 and 36 starts the motor.

Purge

A “Purge” input can be wired to terminals 37 and 38. When this input is closed, the motor runs at the purge frequency, which is defined by Parameter A141 [Purge Frequency], assuming the following conditions exist:

- SS1 is either in the DRIVE or BYPASS position.
- SS2 is either in the HAND or AUTO position if Jumper P1 on the Bypass Control Panel (CP1) is in position A.
- SS2 is in the HAND, MOTOR OFF or AUTO position if jumper P1 on the bypass control panel (CP1) is in position B.
- Interlock wired to terminals 31 and 32 is closed.
- Freeze/Fire Stat wired to terminals 31 and 33 is closed.

ATTENTION: A Purge command takes precedence over a Stop command from the Comm Port/Network. Be sure that another stop method is available if stopping is necessary during a purge.

Bypass Running

The “Bypass Running” contact is normally open. When the bypass contactor (BC) is closed, the “Bypass Running” contact is also closed.

Operating Modes

Selector switch 1 (SS1) and selector switch 2 (SS2), on the bypass control panel (CP1), are used to determine the operating state of the 3-contactor full-feature bypass with disconnect package. SS1 is used to select one of these motor control methods:

- DRIVE = Drive keypad/terminal block controls the motor
- DRIVE TEST = Drive is powered but is not controlling the motor
- BYPASS = Motor runs across 3-phase line

Jumper P2 on the bypass control panel (CP1) enables the drive to be powered while running in bypass. This is accomplished by moving jumper P2 to position B-C and turning SS1 from BYPASS to DRIVE TEST. If jumper P2 is in position A-B, the drive cannot be powered while running in bypass. SS2 selects the source of the start, stop, and drive speed reference as defined in Table 14 on page 63.

Table 14 - Command and Reference Selection

SS1 Selection	SS2 Selection	Start Command			Stop Command			Drive Speed Reference		
		TB	Keypad	None	TB	Keypad	None	TB	Keypad	None
DRIVE	HAND		x			x			x	
	MOTOR OFF			x			x			x
	AUTO	x			x	x		x		
DRIVE TEST	HAND		x			x			x	
	MOTOR OFF			x			x			x
	AUTO	x			x	x		x		
BYPASS	HAND	Automatically starts			Automatically starts			Motor runs at base speed		
	MOTOR OFF			x			x			x
	AUTO	x			x			Motor runs at base speed		

ATTENTION: Three-contactor full-feature bypass with disconnect packages are not designed to allow control over a communication network while in Auto Mode. The communication network is intended only for monitoring purposes. If network control is required, wiring and parameters changes are required.

Parameter Defaults

Three-contactor Full-feature Bypass with Disconnect Package (style B)

Refer to the PowerFlex 70 AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001, for detailed information on parameters and programming.

Parameter Name	Number	Default
Output Freq	001	Read Only
Commanded Freq	002	Read Only
Output Current	003	Read Only
Output Voltage	004	Read Only
Flux Current	005	Read Only
Output Voltage	006	Read Only
Output Power	007	Read Only
Output Powr Fctr	008	Read Only
Elapsed MWh	009	Read Only
Elapsed Run Time	010	Read Only
MOP Frequency	011	Read Only
DC Bus Voltage	012	Read Only
DC Bus Memory	013	Read Only
Elapsed kWh	014(1)	Read Only
Analog In1 Value	016	Read Only
Analog In2 Value	017	Read Only
Ramped Speed	022(1)	Read Only
Speed Reference	023(1)	Read Only
Commanded Torque	024(1)	Read Only
Speed Feedback	025(1)	Read Only
Rated kW	026	Read Only
Rated Volts	027	Read Only
Rated Amps	028	Read Only
Control SW Ver	029	Read Only
Motor Type	040	Induction
Motor NP Volts	041	Drive Rating Based
Motor NP FLA	042	Drive Rating Based
Motor NP Hertz	043	Drive Rating Based
Motor NP PRM	044	Drive Rating Based
Motor NP Power	045	Drive Rating Based
Mtr NP Pwr Units	046	Drive Rating Based
Motor OL Hertz	047	Motor NP Hz/3
Motor OL Factor	048	1.00
Motor Poles	049(1)	4
Motor Cntl Sel	053(2)	3 “FAN/Pump V/Hz”
Maximum Voltage	054	Drive Rated Volts
Maximum Freq	055	110.0 or 130.0 Hz
Compensation	056	Bits 0…6 0101111
Flux Up Mode	057	“Manual”
Flux Up Time	058	0.000 Secs
SV Boost Filter	059	500
Autotune	061	“Calculate”
IR Voltage Drop	062	Based on Drive Rating
Flux Current Ref	063	Based on Drive Rating
Ixo Voltage Drop	064	Based on Drive Rating
Autotune Torque	066(1)	50%
Inertia Autotune	067(1)	“Ready”
St Acc Boost	069	Based on Drive Rating
Run Boost	070	Based on Drive Rating
Break Voltage	071	[Motor NP Volts] × 0.25
Break Frequency	072	[Motor NP Hz] × 0.25
Speed Units	079	0 “Hz”
Feedback Select]	080	0 “Open Loop”
Minimum Speed	081	0.0
Maximum Speed	082	50.0 or 60.0 Hz (volt class) [Motor NP RPM]
Overspeed Limit	083	10.0 Hz 300.0 RPM
Skip Frequency 1	084	0.0 Hz
Skip Frequency 2	085	0.0 Hz
Skip Frequency 3	086	0.0 Hz
Skip Freq Band	087(2)	1.0 Hz
Speed/Torque Mod	088(1)	1 “Speed Reg”
Speed Ref A Sel	090(2)	1 “Analog In 1”
Speed Ref A Hi	091	Maximum Speed
Speed Ref A Lo	092	0.0
Speed Ref B Sel	093(2)	18 “DPI Port 1”
Speed Ref B Hi	094	Maximum Speed
Speed Ref B Lo	095	0.0
TB Man Ref Sel	096	1 “Analog In 1”
TB Man Ref Hi	097	Maximum Speed
TB Man Ref Lo	098	0.0
Pulse Input Ref	099	Read Only
Jog Speed 1	100	10.0 Hz
Preset Speed 1	101	5.0 Hz
Preset Speed 2	102(2)	5.0 Hz
Preset Speed 3	103	20.0 Hz
Preset Speed 4	104	30.0 Hz
Preset Speed 5	105	40.0 Hz
Preset Speed 6	106	50.0 Hz
Preset Speed 7	107	6.0 Hz
Jog Speed 2	108	10.0 Hz
Trim % Setpoint	116(1)	0.0%
Trim In Select	117	2 “Analog In 2”
Trim Out Select	118	0 (Disable)
Trim Hi	119	60.0 Hz
Trim Lo	120	0.0 Hz
Slip RPM @ FLA	121	Based on [Motor NP RPM]
Slip Comp Gain	122	40.0
Slip RPM Meter	123	Read Only
PI Configuration	124	0 (Disable)
PI Control	125	0 (Disable)
PI Reference Sel	126	0 “PI Setpoint”
PI Setpoint	127	50.00%
PI Feedback Sel	128	0 “PI Setpoint”
PI Integral Time	129	2.00 Secs
PI Prop Gain	130	1.0
PI Lower Limit	131	−[Maximum Freq] −100%
PI Upper Limit	132	+[Maximum Freq] 100%
PI Preload	133	0.0 Hz 100.0%
PI Status	134	Read Only
PI Ref Meter	135	Read Only

Parameter Name	Number	Default
PI Fdback Meter	136	Read Only
PI Error Meter	137	Read Only
PI Output Meter	138	Read Only
PI BW Filter	139(1)	0.0 Radians
Accel Time 1	140(2)	20.0 Secs
Accel Time 2	141(2)	20.0 Secs
Decel Time 1	142(2)	20.0 Secs
Decel Time 2	143(2)	20.0 Secs
DB While Stopped	145(1)	0 “Disabled”
S Curve %	146(2)	20%
Current Lmt Sel	147	0 “Cur Lim Val”
Current Lmt Val	148	[Rated Amps] × 1.5 (Equation yields approximate default value.)
Current Lmt Gain	149	250
Drive OL Mode	150	3 “Both–PWM 1st”
PWM Frequency	151	4 kHz 2 kHz (Frames 4…6, 600/690VAC)
Droop RPM @ FLA	152(1)	0.0 RPM
Regen Power Limit	153(1)	–50.0%
Current Rate Limit	154(1)	400.0%
Stop Mode A	155(2)	0 “Coast”
Stop Mode B	156(2)	1 “Ramp”
DC Brake Lvl Sel	157	0 “DC Brake Lvl”
DC Brake Level	158	[Rated Amps]
DC Brake Time	159	0.0 Secs
Bus Reg Ki	160	450
Bus Reg Mode A	161	1 “Adjust Freq”
Bus Reg Mode B	162(2)	0 “Disabled”
DB Resistor Type	163	0 “None”
Bus Reg Kp	164(2)	1200
Bus Reg Kd	165	1000
Flux Braking	166(1)	0 “Disabled”
Powerup Delay	167(1)	0.0 Secs
Start At PowerUp	168(2)	1 “Enabled”
Flying Start En	169(2)	1 “Enabled”
Flying StartGain	170	4000
Auto Rstrt Tries	174	0
Auto Rstrt Delay	175(2)	30.0 Secs
Gnd Warn Level	177(1)	3.0 Amps

Parameter Name	Number	Default
Sleep-Wake Mode	178	0 “Disabled”
Sleep-Wake Ref	179	2 “Analog In 2”
Wake Level	180	6.000 mA, 6.000 Volts
Wake Time	181	1.0 Secs
Sleep Level	182	5.000 mA, 5.000 Volts
Sleep Time	183	1.0 Secs
Power Loss Mode	184	0 “Coast”
Power Loss Time	185	0.5 Secs
Power Loss Level	186(3)	Drive Rated Volts
Load Loss Level	187(1)	200.0%
Load Loss Time	188(1)	0.0 Secs
Shear Pin Time	189(1)	0.0 Secs
Direction Mode	190(2)	2 “Reverse Dis”
Save HIM Ref	192	0 Hz
Man Ref Preload	193(3)	0 “Disabled”
Save MOP Ref	194(2)	At Pwr Down
MOP Rate	195	1.0 Hz/s 30.0 RPM/s
Param Access Lvl	196(2)	3 “Fan/Pump”
Reset To Defalts	197	0 “Ready”
Load Frm Usr Set	198	0 “Ready”
Save To User Set	199	0 “Ready”
Reset Meters	200	0 “Ready”
Language	201	0 “Not Selected”
Voltage Class	202	Based on Drive Cat. No.
Drive Checksum	203	Read Only
Dyn UsrSet Cnfg	204(1)	0 “Disabled”
Dyn UsrSet Sel	205(1)	0 “Disabled”
Dyn UsrSet Actv	206(1)	0 “Disabled”
Drive Status 1	209	Read Only
Drive Status 2	210	Read Only
Drive Alarm 1	211	Read Only
Drive Alarm 2	212	Read Only
Speed Ref Source	213	Read Only
Start Inhibits	214	Read Only
Last Stop Source	215	Read Only
Dig In Status	216	Read Only
Dig Out Status	217	Read Only
Drive Temp	218	Read Only

Parameter Name	Number	Default
Drive OL Count	219	Read Only
Motor OL Count	220	Read Only
Fault Speed	224	Read Only
Fault Amps	225	Read Only
Fault Bus Volts	226	Read Only
Status 1 @ Fault	227	Read Only
Status 2@ Fault	228	Read Only
Alarm 1 @ Fault	229	Read Only
Alarm 2@ Fault	230	Read Only
Testpoint 1 Sel	234	499
Testpoint 2 Sel	236	499
Testpoint 1 Data	235	Read Only
Testpoint 2 Data	237	Read Only
Fault Config 1	238	Bits 0…15 01x1001000x000xx
Fault Clear	240	0 “Ready”
Fault Clear Mode	241	1 “Enabled”
Power Up Marker	242	Read Only
Fault 1 Code	243	Read Only
Fault 1 Time	244	Read Only
Fault 2 Code	245	Read Only
Fault 2 Time	246	Read Only
Fault 3 Code	247	Read Only
Fault 3 Time	248	Read Only
Fault 4 Code	249	Read Only
Fault 4 Time	250	Read Only
Fault 5 Code	251(3)	Read Only
Fault 5 Time	252(3)	Read Only
Fault 6 Code	253(3)	Read Only
Fault 6Time	254(3)	Read Only
Fault 7 Code	255(3)	Read Only
Fault 7 Time	256(3)	Read Only
Fault 8 Code	257(3)	Read Only
Fault 8 Time	258(3)	Read Only
Alarm Config 1	259	Bits 0-15 000000x00000000x
Alarm Clear	261(3)	0 “Ready”
Alarm 1 Code	262(3)	Read Only
Alarm 2 Code	263(3)	Read Only
Alarm 3 Code	264(3)	Read Only
Alarm 4 Code	265(3)	Read Only

Parameter Name	Number	Default
Alarm 5 Code	266[3]	Read Only
Alarm 6 Code	267[3]	Read Only
Alarm 7 Code	268[3]	Read Only
Alarm 8 Code	269[3]	Read Only
DPI Baud Rate	270	1 “500kbps”
Drive Logic Rslt	271	Read Only
Drive Ref Rslt	272	Read Only
Drive Ramp Rslt	273	Read Only
DPI Port Sel	274[1]	“DPI Port 1”
DPI Port Value	275[1]	Read Only
Logic Mask	276[1]	1 - Control Permitted
Start Mask	277	(See Logic Mask)
Jog Mask	278	(See Logic Mask)
Direction Mask	279	(See Logic Mask)
Reference Mask	280	(See Logic Mask)
Accel Mask	281	(See Logic Mask)
Decel Mask	282	(See Logic Mask)
Fault Clr Mask	283	(See Logic Mask)
MOP Mask	284	(See Logic Mask)
Local Mask	285	(See Logic Mask)
Stop Owner	288	Read Only
Start Owner	289	(See Stop Owner)
Jog Owner	290	(See Stop Owner)
Direction Owner	291	(See Stop Owner)
Reference Owner	292	(See Stop Owner)
Accel Owner	293	(See Stop Owner)
Decel Owner	294	(See Stop Owner)
Fault Clr Owner	295	(See Stop Owner)
MOP Owner	296	(See Stop Owner)
Local Owner	297	(See Stop Owner)
DPI Ref Select	298[1]	0 “Max Freq”
DPI Fdbk Select	299	17 “Speed Fdbk”
Data In A1 - Link A Word 1	300	0(0 = “Disabled)
Data In A2 - Link A Word 2	301	0(0 = “Disabled)
Data In B1 - Link B Word 1	302	(See Data In A1 - Link A Word 1)
Data In B2 - Link B Word 2	303	(See Data In A2 - Link A Word 2)
Data In C1 - Link C Word 1	304	(See Data In A1 - Link A Word 1)
Data In C2 - Link C Word 2	305	(See Data In A2 - Link A Word 2)
Data In D1 - Link D Word 1	306	(See Data In A1 - Link A Word 1)
Data In D2 - Link D Word 2	307	(See Data In A2 - Link A Word 2)
Data Out A1 - Link A Word 1	310	0(0 = “Disabled)
Data Out A2 - Link A Word 2	311	0(0 = “Disabled)
Data Out B1 - Link A Word 1	312	(See Data Out A1 - Link A Word 1)
Data Out B2 - Link A Word 2	313	(See Data Out A2 - Link A Word 2)
Data Out C1 - Link A Word 1	314	(See Data Out A1 - Link A Word 1)
Data Out C2 - Link A Word 2	315	(See Data Out A2 - Link A Word 2)
Data Out D1 - Link A Word 1	316	(See Data Out A1 Link A Word 1)
Data Out D2 - Link A Word 2	317	(See Data Out A2 - Link A Word 2)
Anlg In Config	320[2]	Analog In 1 = 0.0 Volt
Anlg In Sqr Root	321	0 (Disable)
Analog In 1 Hi	322	10.000 Volt
Analog In 1 Lo	323	0.000 Volt
Analog In 1 Loss	324	0 “Disabled”
Analog In 2 Hi	325	10.000 Volt
Analog In 2 Lo	326	0.000 Volt
Analog In 2 Loss	327	0 “Disabled”
Anlg Out Config	340	1 (Current)
Anlg Out Absolut	341	1 (Absolute)
Analog Out1 Sel	342	0 “Output Freq”
Analog Out1 Hi	343	20.000 mA, 10.000 Volts
Analog Out1 Lo	344	0.000 mA, 0.000 Volts
Analog Out2 Sel	345	0 “Output Freq”
Analog Out Hi	346	20.000 mA, 10.000 Volts
Analog Out2 Lo	347	0.000 mA, 0.000 Volts
Anlg Out1 Scale	354[1]	0.0
Anlg Out2 Scale	355[1]	0.0
Digital In1 Sel	361	4 “Stop – CF”
Digital In2 Sel	362	5 “Start”
Digital In3 Sel	363[2]	3 “Aux Fault”
Digital In4 Sel	364[2]	1 “Enable”
Digital In5 Sel	365[2]	15 “Speed Sel 1”
Digital In6 Sel	366[2]	16 “Speed Sel 2”
Anlg1 Out Setpt	377[1]	20.000 mA, 10.000 Volts
Anlg2 Out Setpt	378	20.000 mA, 10.000 Volts
Dig Out Setpt	379[1]	0 (Disable)
Digital Out1 Sel	380[4]	1 “Fault”
Dig Out1 Level	381	0.0
Dig Out1 OnTime	382	0.00 Secs
Dig Out1 OffTime	383	0.00 Secs
Digital Out2 Sel	384	4 “Run”
Dig Out2 Level	385	0.0
Dig Out2 OnTime	386	0.00 Secs
Dig Out2 OffTime	387	0.00 Secs
Digital Out3 Sel	388	4 “Run”
Dig Out3 Level	389	0.0
Dig Out3 OnTime	390	0.00 Secs
Dig Out3 OffTime	391	0.00 Secs
Dig Out Param	393	0 “PI Config”
DigIn DataLogic	411[1]	0=Logical 0
Motor Fdbk Type	412[1]	0 “Quadrature”
Encoder PPR	413[1]	1024 PPR
Enc Position Fdbk	414[1]	Read Only
Encoder Speed	415[1]	Read Only
Fdbk Filter Sel	416[1]	0 “None”
Notch FilterFreq	419[1]	0.0 Hz
Notch Filter K	420[1]	0.3 Hz
Marker Pulse	421	Read Only
Pulse In Scale	422	64
Encoder Z Chan	423	0 “Pulse Input”
Torque Ref A Sel	427	1 “Torque Stpt1”
Torque Ref A Hi	428[1]	100.0%
Torque Ref A Lo	429[1]	0.0%
Torq Ref A Div	430[1]	1.0
Torque Ref B Sel	431	24 “Disabled”
Torque Ref B Hi	432	100.0%
Torque Ref B Lo	433	0.0%
Torque Ref B Mult	434	1.0

Parameter Name	Number	Default
Torque Setpoint1	435(1)	0.0%
Pos Torque Limit	436(1)	200.0%
Neg Torque Limit	437(1)	-200.0%
Torque Setpoint2	438	0.0%
Control Status	440(1)	Read Only
Mtr Tor Cur Ref	441(1)	Read Only
Ki Speed Loop	445(1)	7.0
Kp Speed Loop	446(1)	6.3
Kf Speed Loop	447(1)	0.0
Speed Desired BW	449(1)	0.0 Radians/Sec
Total Inertia	450(1)	1.25 Secs 0.10 Secs (v3)
Speed Loop Meter	451(1)	Read Only
Rev Speed Limit	454(1)	0.0 RPM
PI Deriv Time	459(1)	0.00 Secs
PI Reference Hi	460(1)	100.0%
PI Reference Lo	461(1)	-100.0%
PI Feedback Hi	462(1)	100.0%
PI Feedback Lo	463(1)	0.0%
Scale1 In Value	476	0.0
Scale1 In Hi	477	0.0
Scale1 In Lo	478	0.0
Scale1 Out Hi	479	0.0
Scale1 Out Lo	480	0.0
Scale1 Out Value	481	Read Only
Scale2 In Value	482	0.0
Scale2 In Hi	483	0.0
Scale2 In Lo	484	0.0
Scale2 Out Hi	485	0.0

Parameter Name	Number	Default
Scale2 Out Lo	486	0.0
Scale2 Out Value	487	Read Only
Scale3 In Value	488	0.0
Scale3 In Hi	489	0.0
Scale3 In Lo	490	0.0
Scale3 Out Hi	491	0.0
Scale3 Out Lo	492	0.0
Scale3 Out Value	493	Read Only
Scale4 In Value	494	0.0
Scale4 In Hi	495	0.0
Scale4 In Lo	496	0.0
Scale4 Out Hi	497	0.0
Scale4 Out Lo	498	0.0
Scale4 Out Value	499	Read Only
PortMask Act	595(1)	Read Only
Write Mask Cfg	596(1)	1 = Write Permitted
Write Mask Act	597(1)	Read Only
Logic Mask Act	598(1)	Read Only
TorqProve Cnfg	600	0 (Disable)
TorqProve Setup	601	0 (Disable)
Spd Dev Band	602	2.0 Hz 60.0 RPM
SpdBand Integrat	603	60 mSec
Brk Release Time	604	0.10 Secs
ZeroSpdFloatTime	605	5.0 Secs
Float Tolerance	606	0.2 Hz 6.0 RPM
Brk Set Time	607	0.10 Secs
TorqLim SlewRate	608	10.0 Secs

Parameter Name	Number	Default
BrkSlip Count	609	250
Brk Alarm Travel	610	1.0 Revs
MicroPos Scale%	611	10.0%

(1) Applicable only to PowerFlex 70 Packages.
(2) The default values for these parameters differ from the factory defaults. Setting 194 [Reset To Defalts] to 1 "Factory Rset" changes these parameter settings to the defaults listed in the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001.
(3) Applicable only to PowerFlex 700 Packages.
(4) When [TorqProve Cnfg] is set to "Enable," [Digital Out1 Sel] becomes the brake control and any other selection is ignored.

ATTENTION: Parameter 168 [Start At PowerUp] ships from the factory enabled. This feature enables a Run command to automatically cause the drive to resume running at commanded speed after drive input power is restored. Equipment damage and/or personal injury can result if this parameter is used in an inappropriate application. Do not use this function without considering applicable local, national and international codes, standards, regulations, or industry guidelines.

Drawing Index

Three-contactor Full-feature Bypass with Disconnect Package (style B)

The tables on the following pages provide links to the drawings for the various voltages and kW/Hp ratings for the style B packaged drives:

- Table 15, Three-contactor Full-feature Bypass with Disconnect Package (style B), 208V on page 68
- Table 16, Three-contactor Full-feature Bypass with Disconnect Package (style B), 480V on page 69
- Table 17, Three-contactor Full-feature Bypass with Disconnect Package (style B), 600V on page 70

Table 15 - Three-contactor Full-feature Bypass with Disconnect Package (style B), 208V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
208V AC	0.75	1.0	No	Figure 54 on page 95	Figure 45 on page 86	Figure 30 on page 71	Figure 42 on page 83
	1.5	2.0					
	2.2	3.0					
	4.0	5.0		Figure 55 on page 96			
	5.5	7.5		Figure 56 on page 97			
	7.5	10					
	11	15		Figure 57 on page 98	Figure 46 on page 87		
	0.75	1.0	Yes	Figure 62 on page 103	Figure 51 on page 92	Figure 38 on page 79	Figure 44 on page 85
	1.5	2.0					
	2.2	3.0					
	4.0	5.0		Figure 63 on page 104	Figure 52 on page 93		
	5.5	7.5		Figure 64 on page 105			
	7.5	10			Figure 53 on page 94		

Table 16 - Three-contactor Full-feature Bypass with Disconnect Package (style B), 480V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
480V AC	0.75	1.0	No	Figure 54 on page 95	Figure 45 on page 86	Figure 30 on page 71	Figure 42 on page 83
	1.5	2.0					
	2.2	3.0					
	4.0	5.0					
	5.5	7.5		Figure 55 on page 96			
	7.5	10					
	11	15		Figure 56 on page 97			
	15	20					
	18.5	25					
	22	30		Figure 57 on page 98	Figure 46 on page 87		
	30	40		Figure 58 on page 99	Figure 47 on page 88		
	37	50					
	45	60		Figure 59 on page 100	Figure 48 on page 89	Figure 32 on page 73	Figure 43 on page 84
	55	75		Figure 60 on page 101	Figure 49 on page 90		
	75	100					
	90	125		Figure 61 on page 102	Figure 50 on page 91		
	110	150					
	0.75	1.0	Yes	Figure 62 on page 103	Figure 51 on page 92	Figure 38 on page 79	Figure 44 on page 85
	1.5	2.0					
	2.2	3.0					
	4.0	5.0					
	5.5	7.5		Figure 63 on page 104	Figure 52 on page 93		
	7.5	10					
	11	15		Figure 64 on page 105	Figure 53 on page 94		
	15	20					
	18.5	25					

Table 17 - Three-contactor Full-feature Bypass with Disconnect Package (style B), 600V

Input Voltage	kW	Hp	Input Line Reactor	Drawing			
				Outline	Layout	Schematic	Inter-connect
600V AC	2.2	3.0	No	Figure 54 on page 95	Figure 45 on page 86	Figure 34 on page 75	Figure 42 on page 83
	4.0	5.0					
	5.5	7.5		Figure 55 on page 96			
	7.5	10					
	11	15		Figure 56 on page 97			
	15	20					
	18.5	25					
	22	30		Figure 57 on page 98	Figure 46 on page 87		
	30	40		Figure 58 on page 99	Figure 47 on page 88		
	37	50					
	45	60		Figure 59 on page 100	Figure 48 on page 89	Figure 36 on page 77	Figure 43 on page 84
	55	75		Figure 60 on page 101	Figure 49 on page 90		
	75	100					
	90	125		Figure 61 on page 102	Figure 50 on page 91		
	110	150					
	2.2	3.0	Yes	Figure 62 on page 103	Figure 51 on page 92	Figure 39 on page 80	Figure 44 on page 85
	4.0	5.0					
	5.5	7.5		Figure 63 on page 104	Figure 52 on page 93		
	7.5	10					
	11	15		Figure 64 on page 105	Figure 53 on page 94		
	15	20					
	18.5	25					

Schematic Drawings

Figure 30 - 1…15 Hp, 208V AC; and 1…50 Hp, 480V AC Drives (sheet 1 of 2)

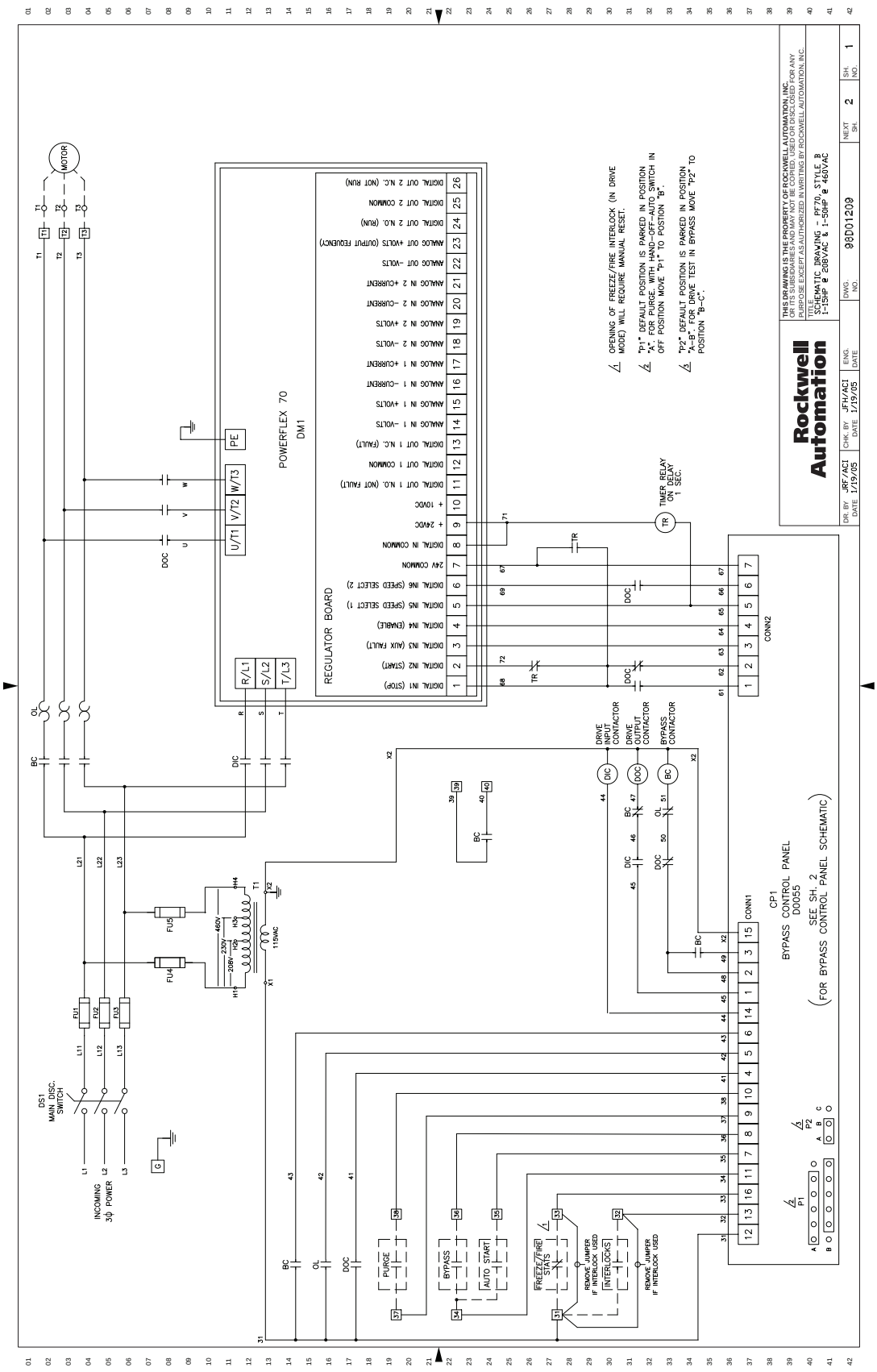


Figure 31 - 1…15 Hp, 208V AC; and 1…50 Hp, 480V AC Drives (sheet 2 of 2)

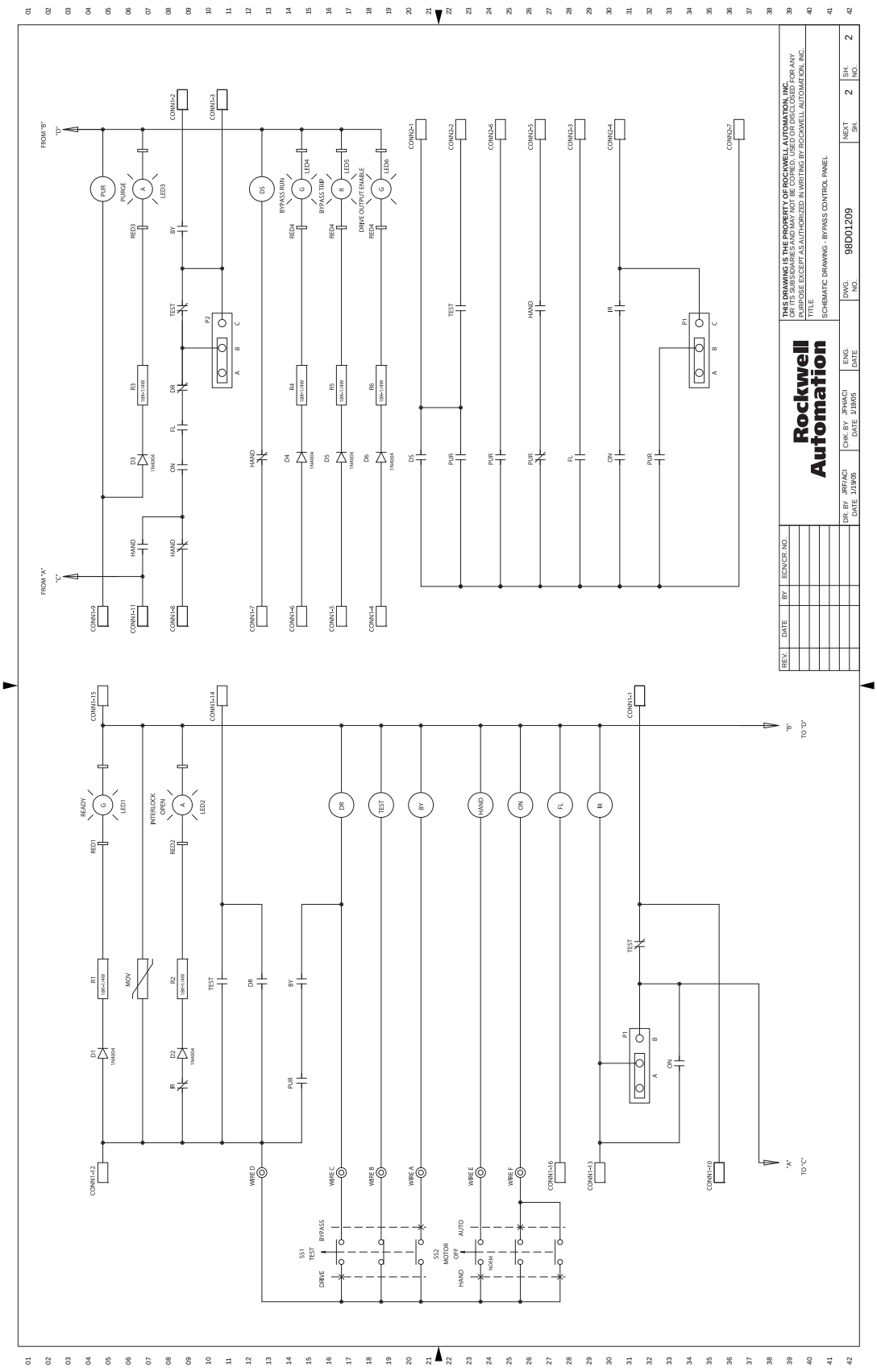


Figure 32 - 60…150 Hp, 480V AC Drives (sheet 1 of 2)

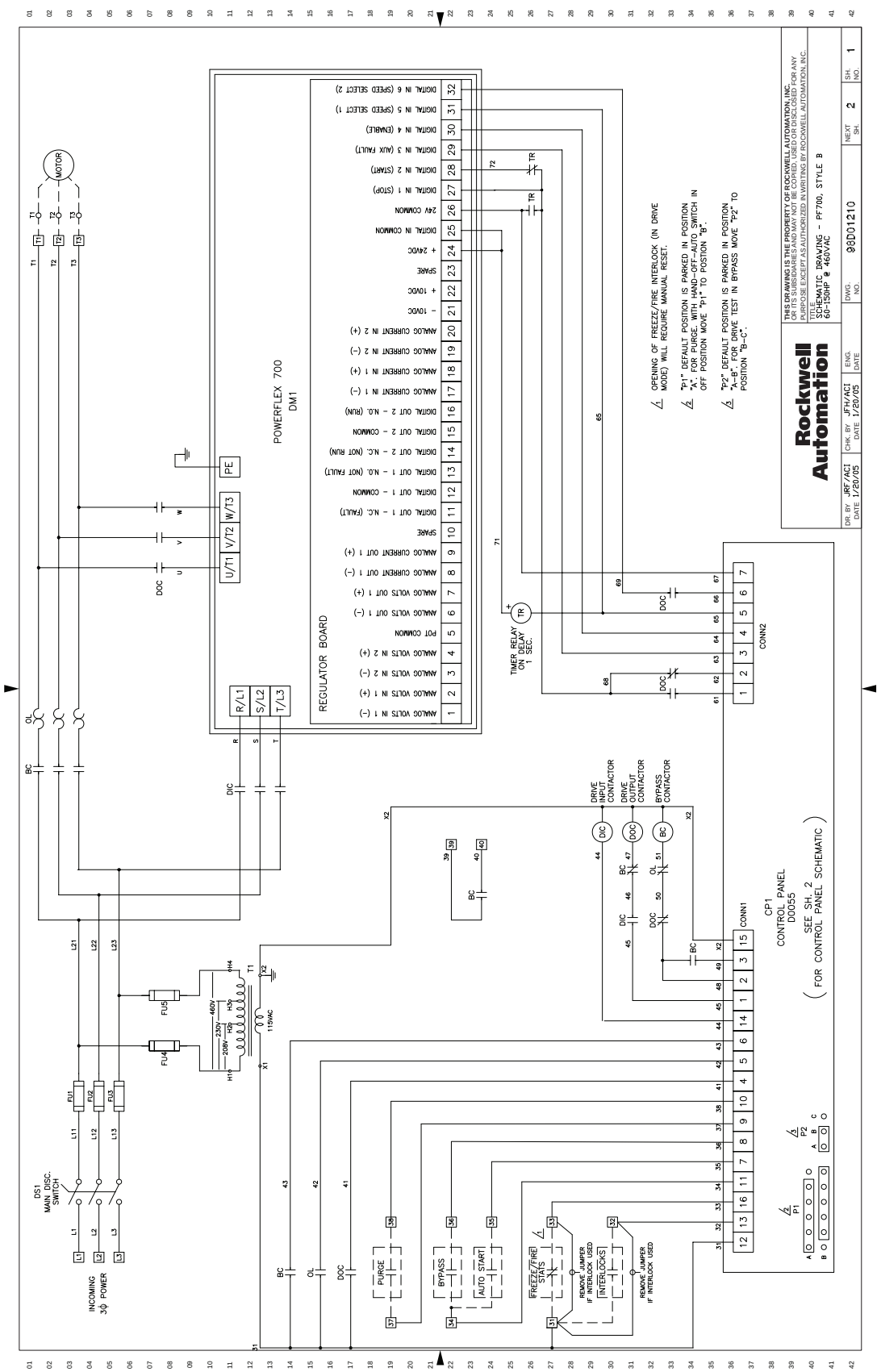


Figure 33 - 60…150 Hp, 480V AC Drives (sheet 2 of 2)

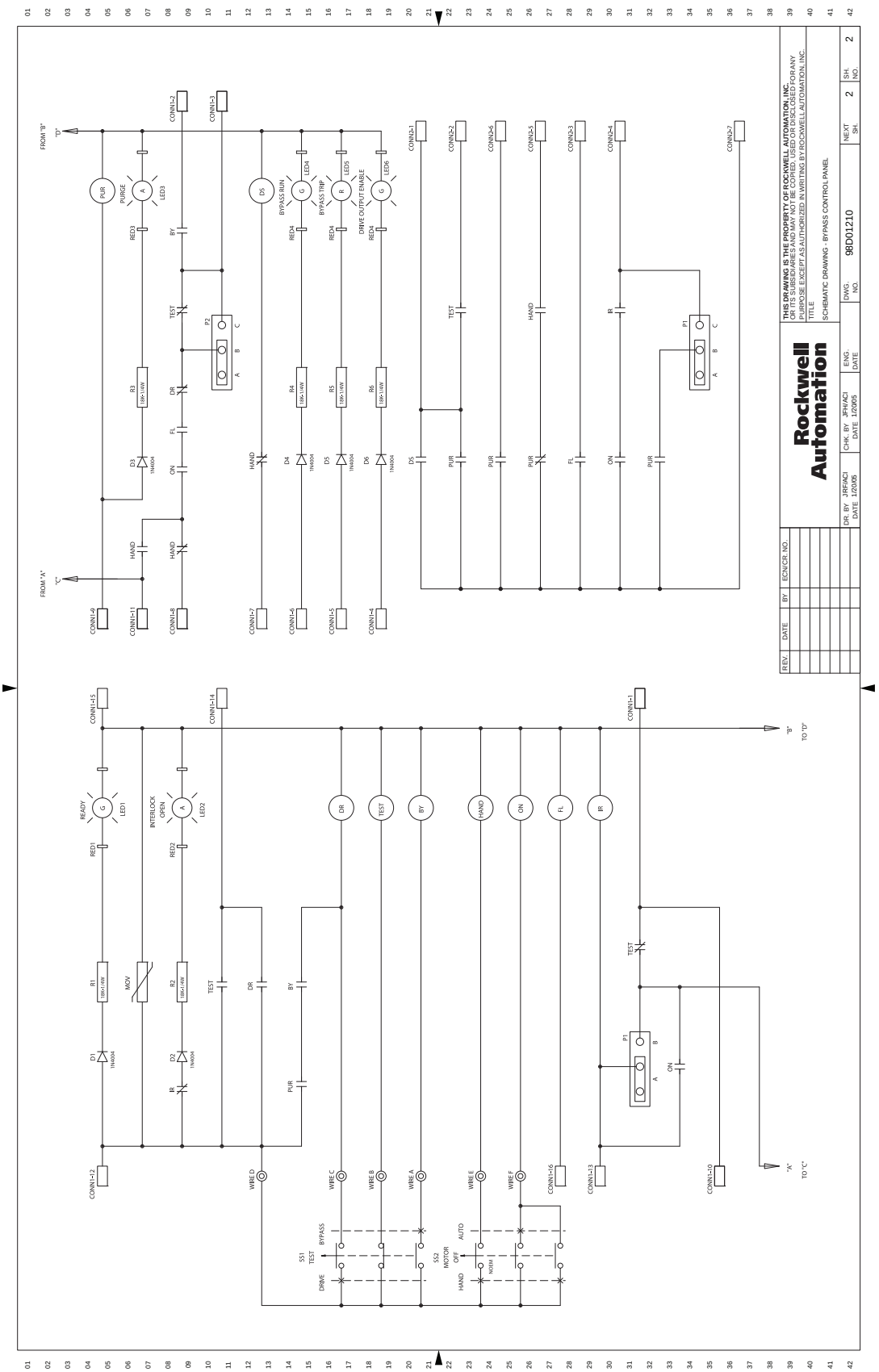


Figure 34 - 1…50 Hp, 600V AC Drives (sheet 1 of 2)

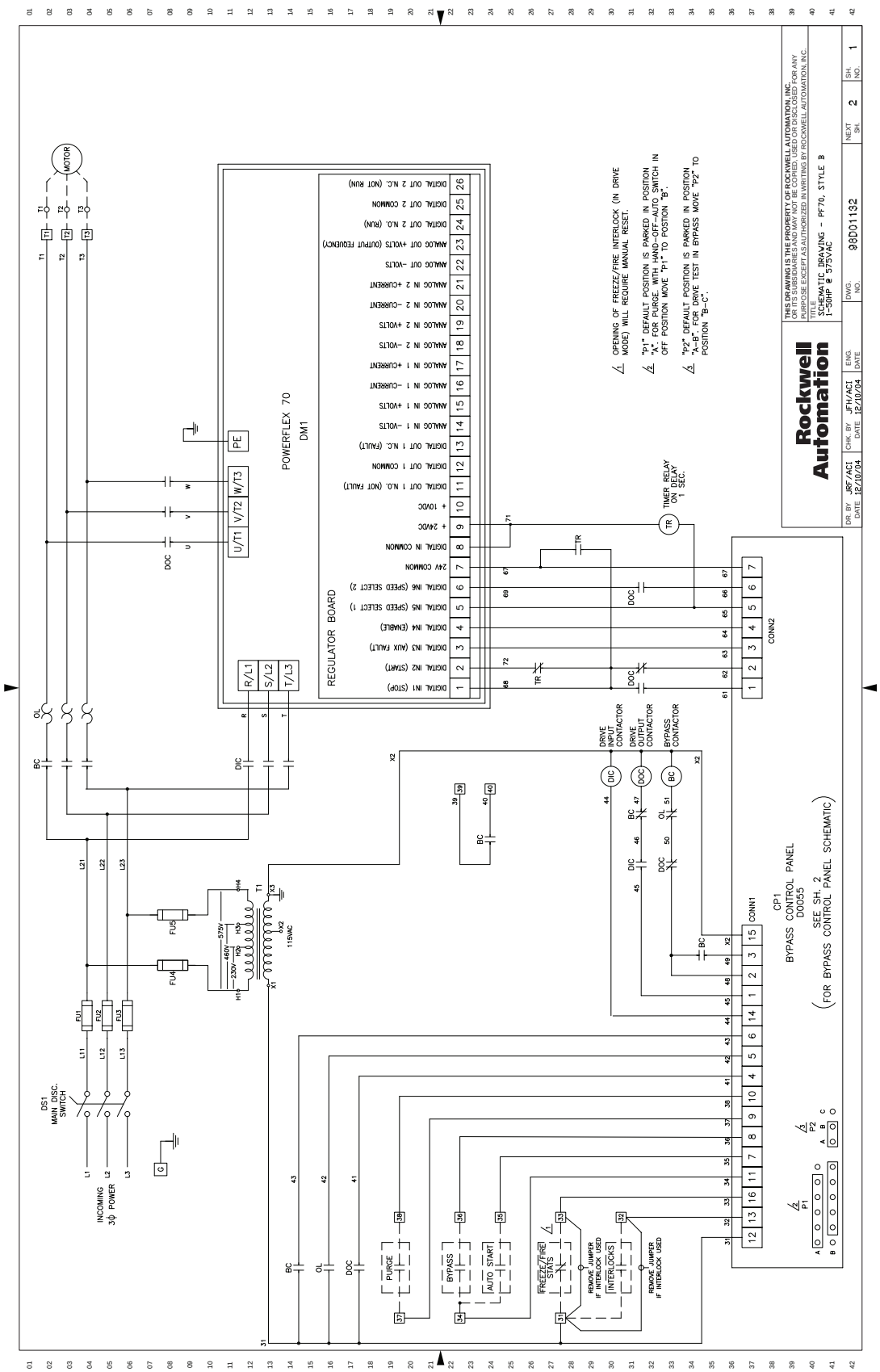


Figure 35 - 1…50 Hp, 600V AC Drives (sheet 2 of 2)

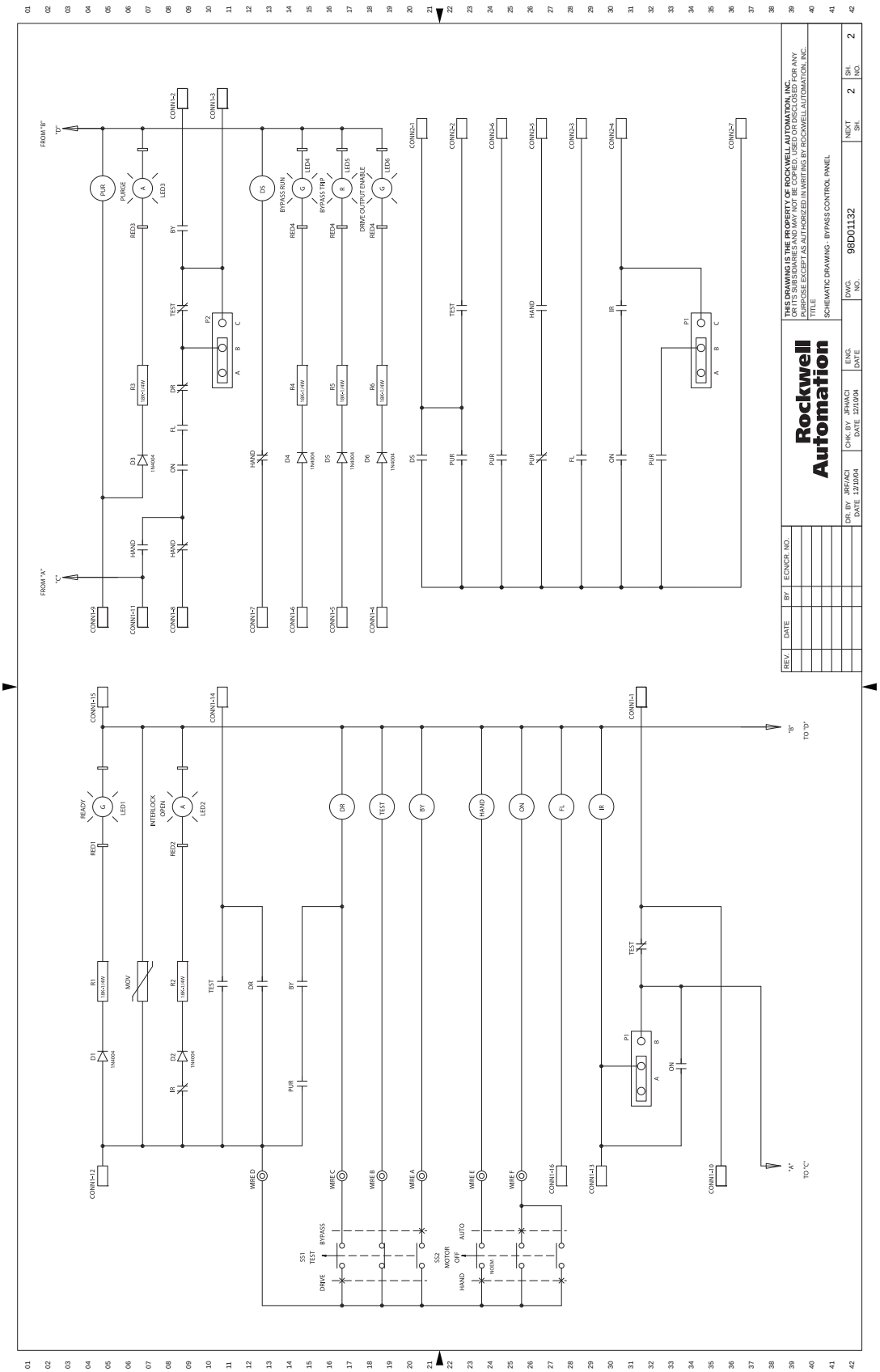


Figure 36 - 60…150 Hp, 600V AC Drives (sheet 1 of 2)

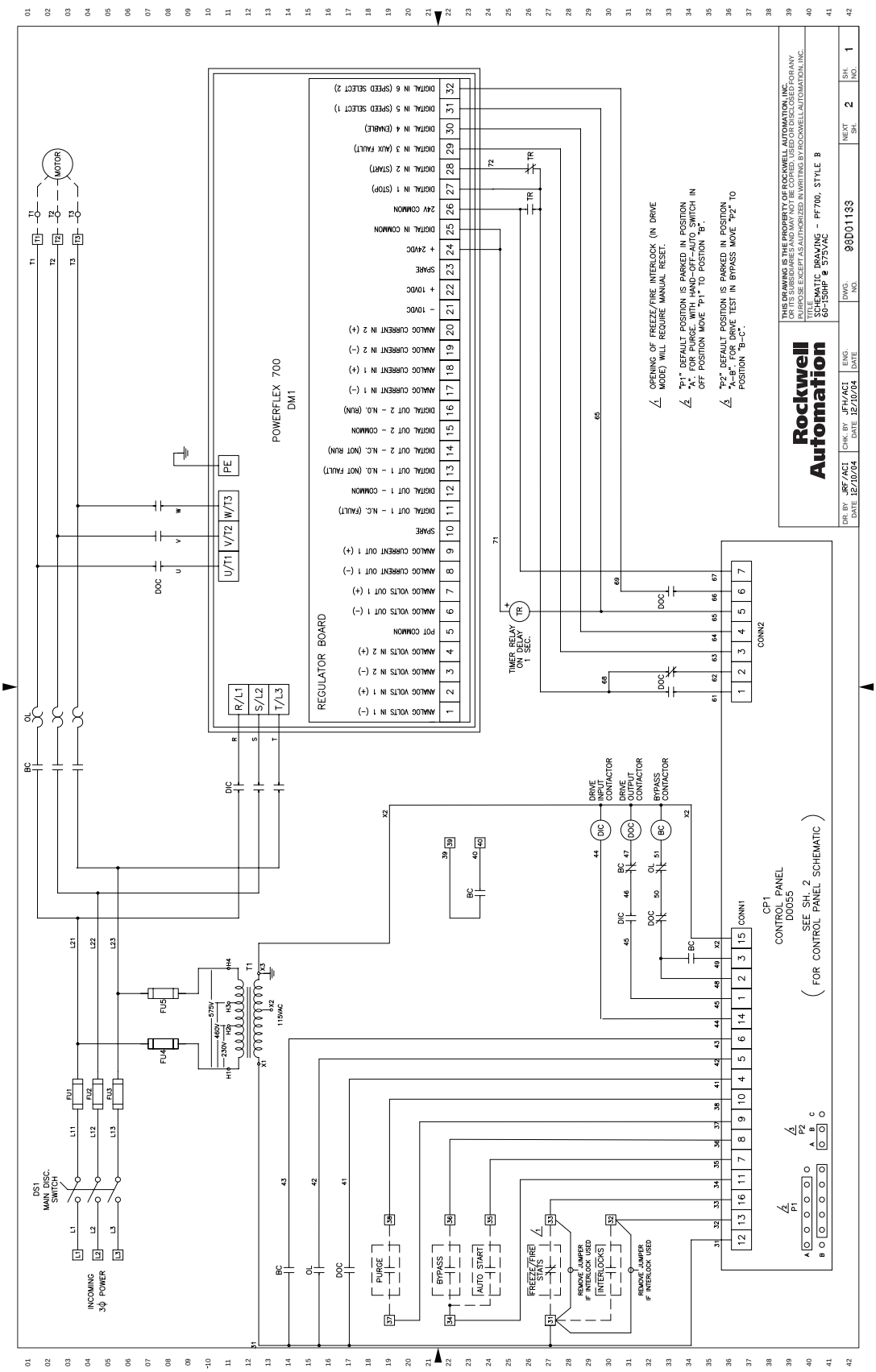


Figure 37 - 60…150 Hp, 600V AC Drives (sheet 2 of 2)

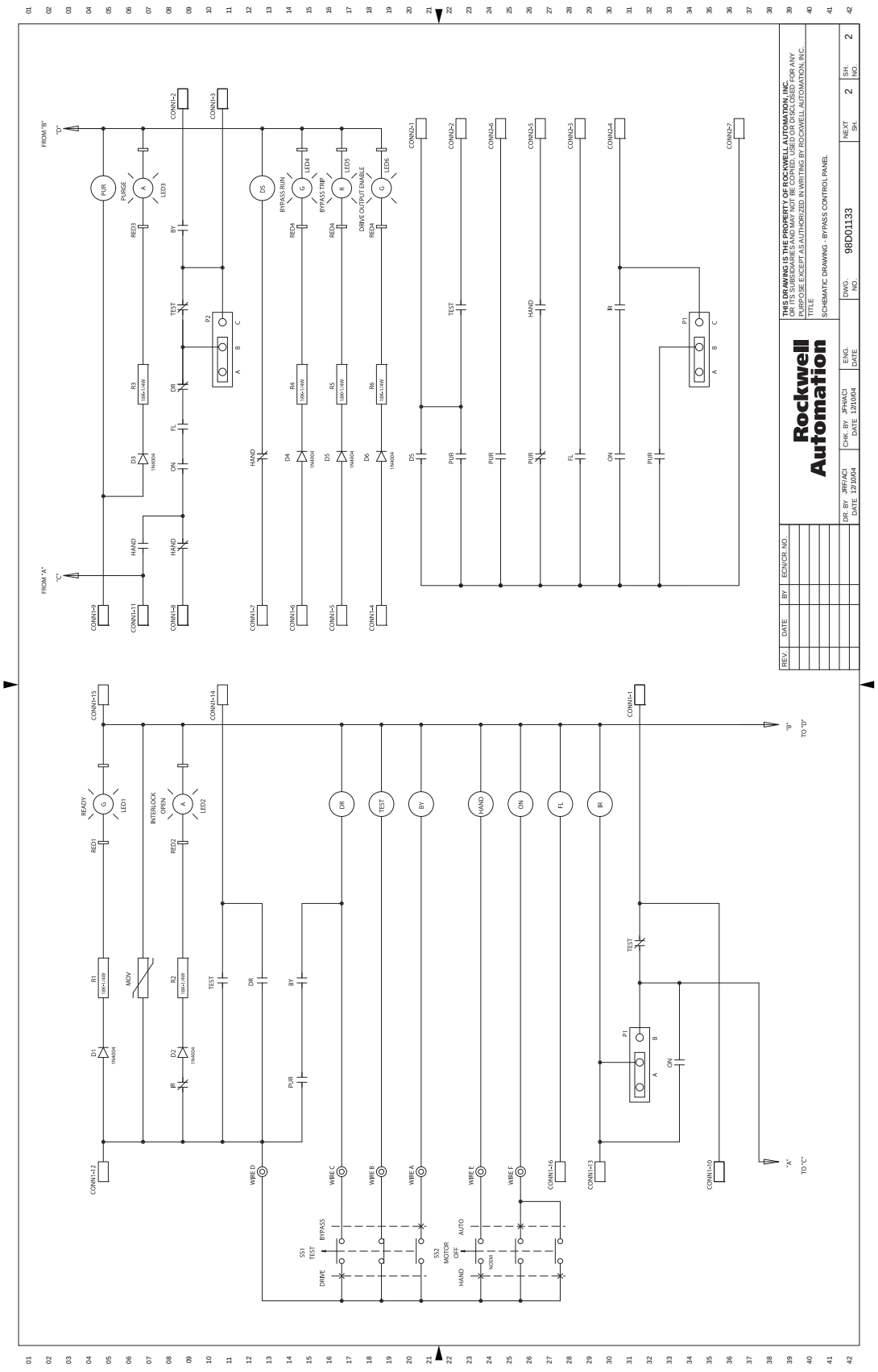


Figure 38 - 1…10 Hp, 208V AC; and 1…25 Hp, 480V AC Drives with Line Reactor (sheet 1 of 2)

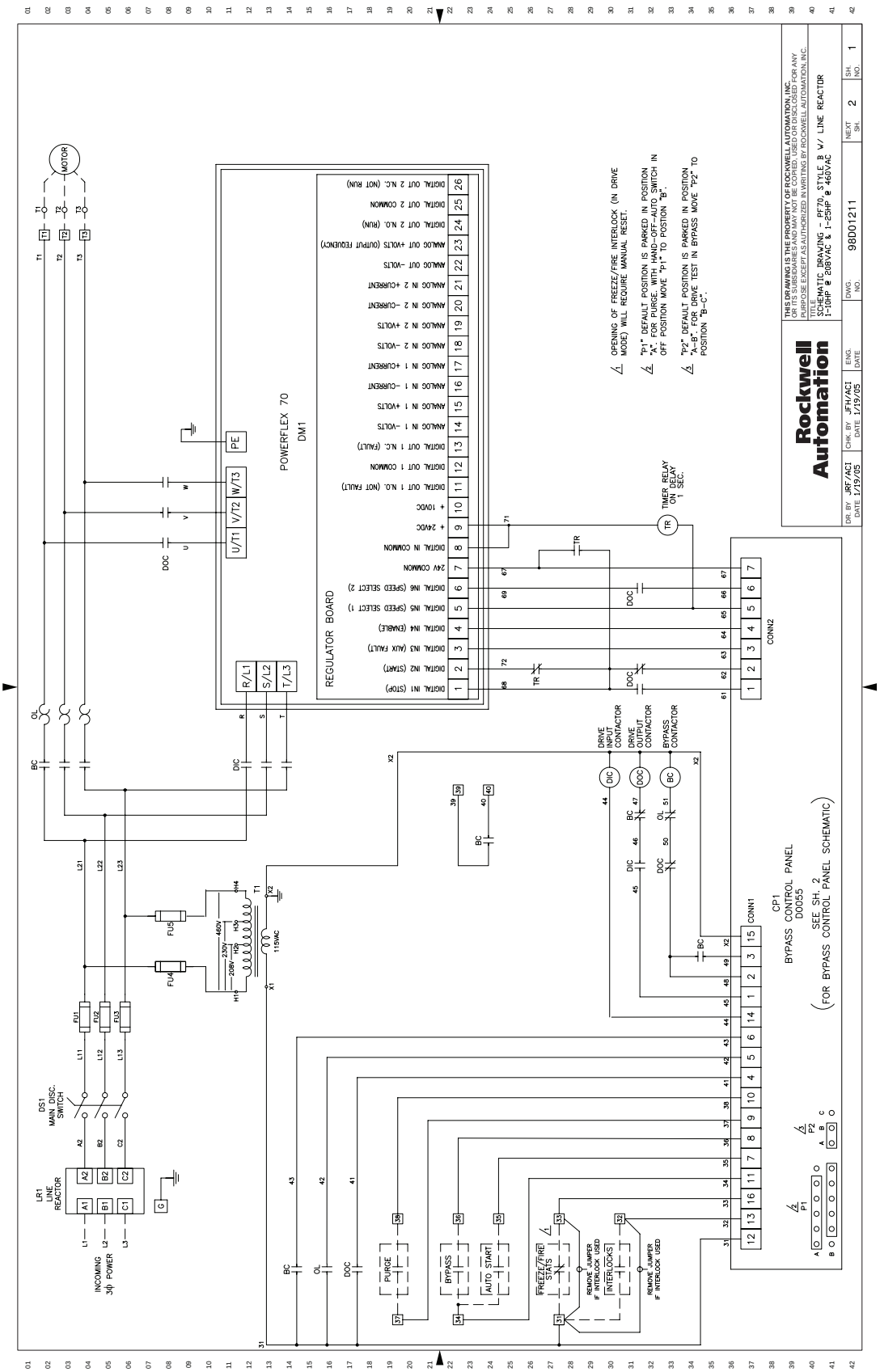


Figure 39 - 1…10 Hp, 208V AC; and 1…25 Hp, 480V AC Drives with Line Reactor (sheet 2 of 2)

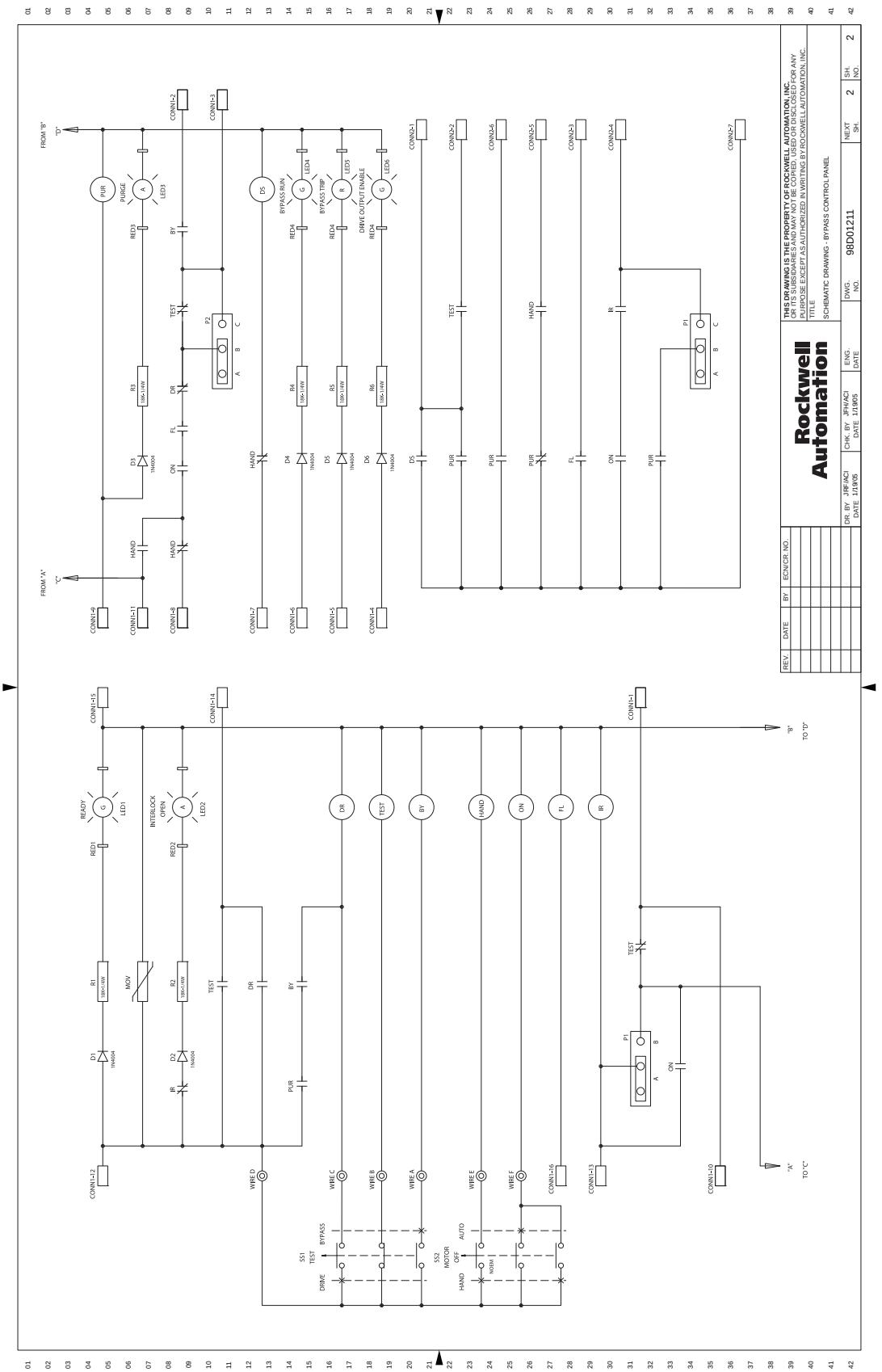


Figure 40 - 3…25 Hp, 600V AC Drives with Line Reactor (sheet 1 of 2)

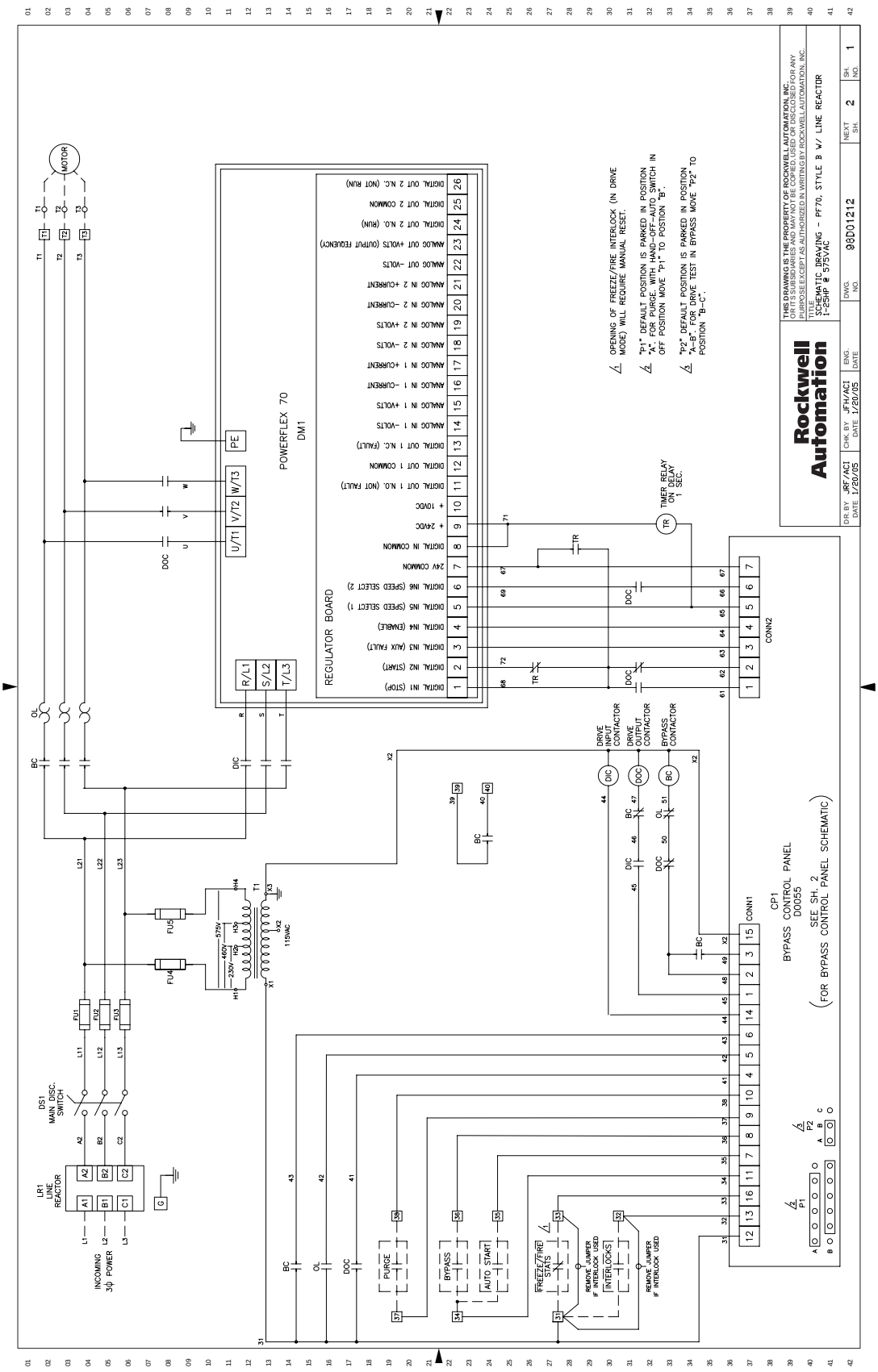
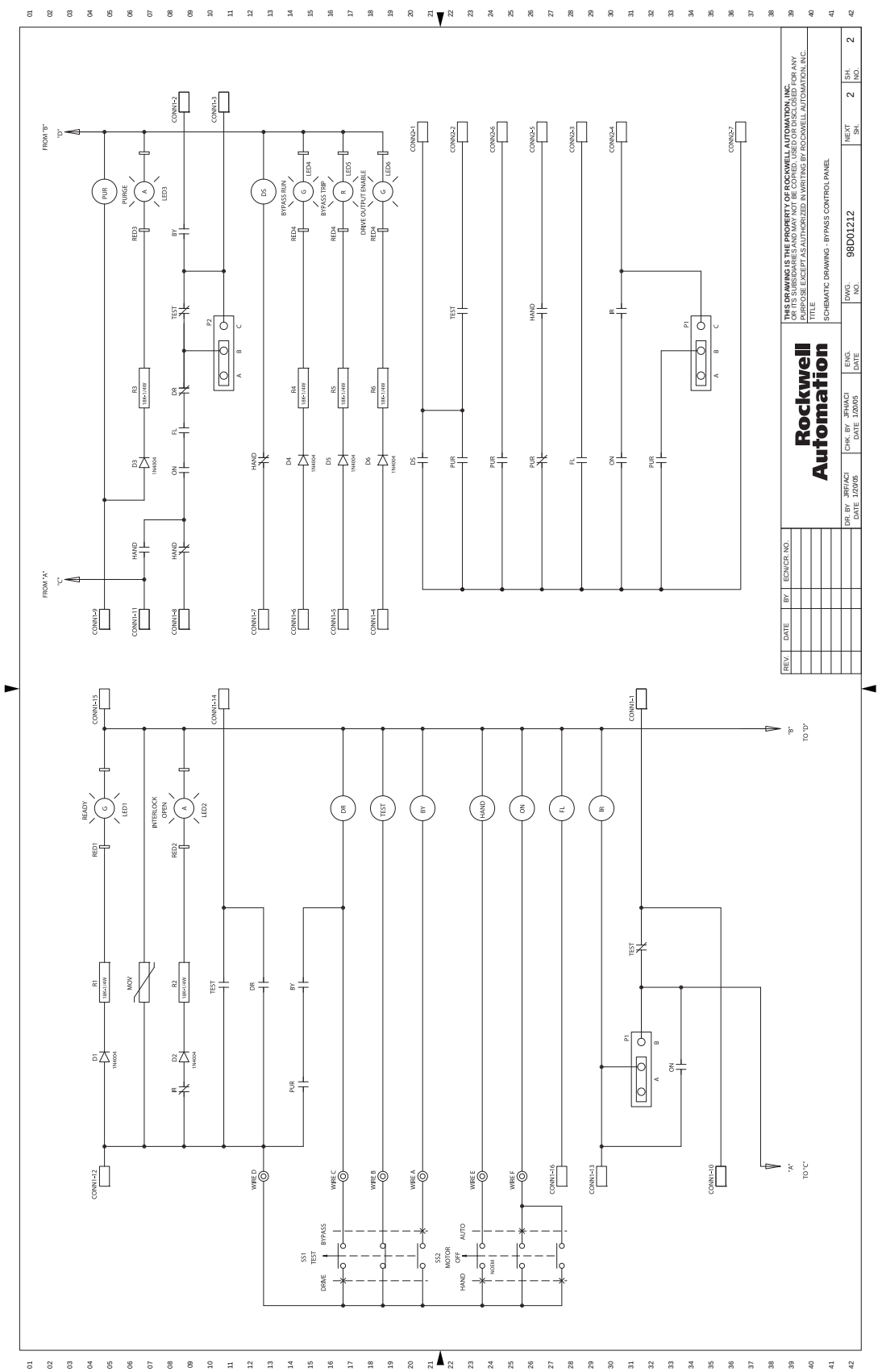


Figure 41 - 3…25 Hp, 600V AC Drives with Line Reactor (sheet 2 of 2)



Inter-connect Drawings

Figure 42 - 1…15 Hp, 208V AC; and 1…50 Hp, 480V AC and 600V AC Drives

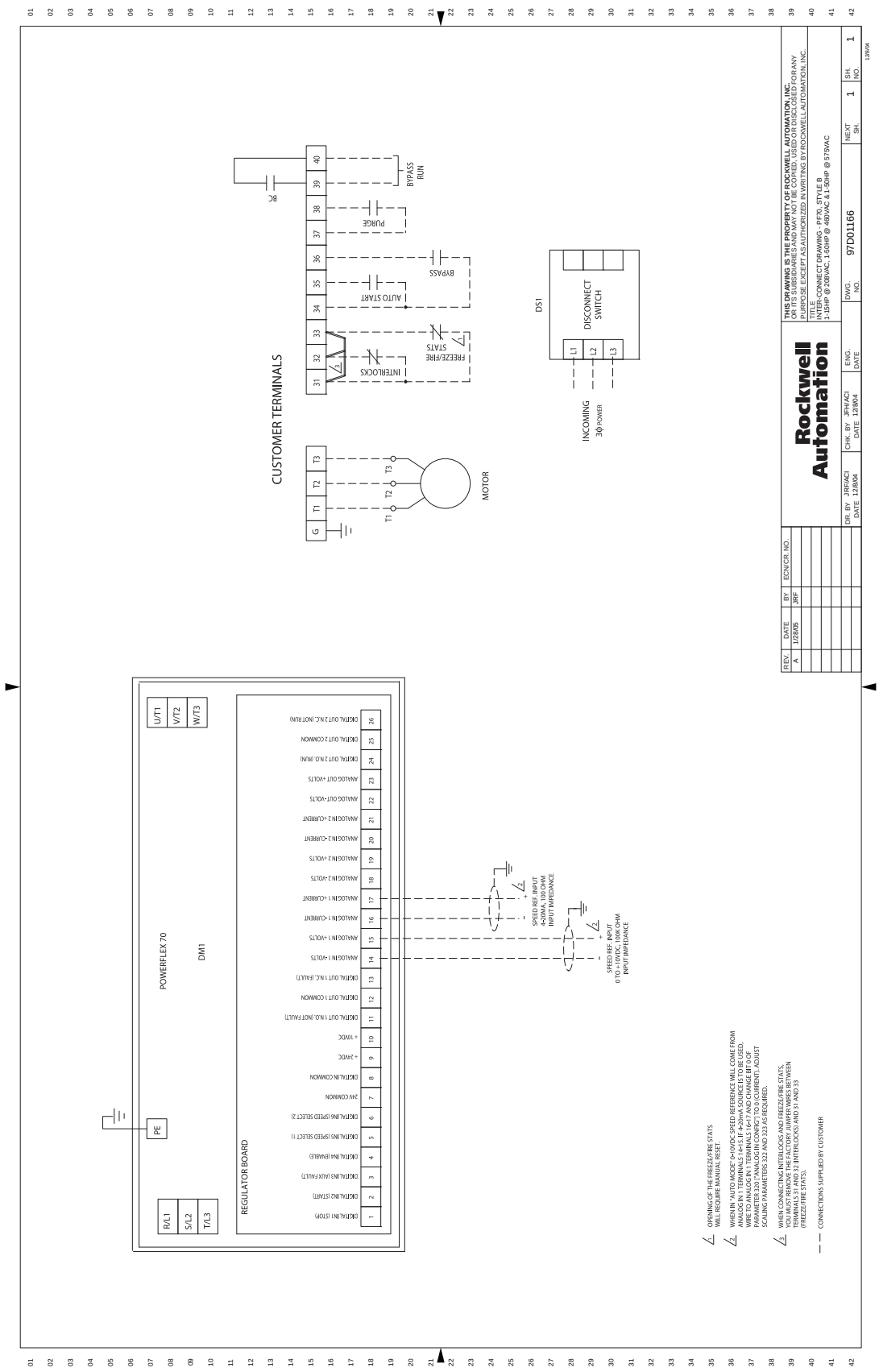


Figure 43 - 60…150 Hp, 480V AC and 600V AC Drives

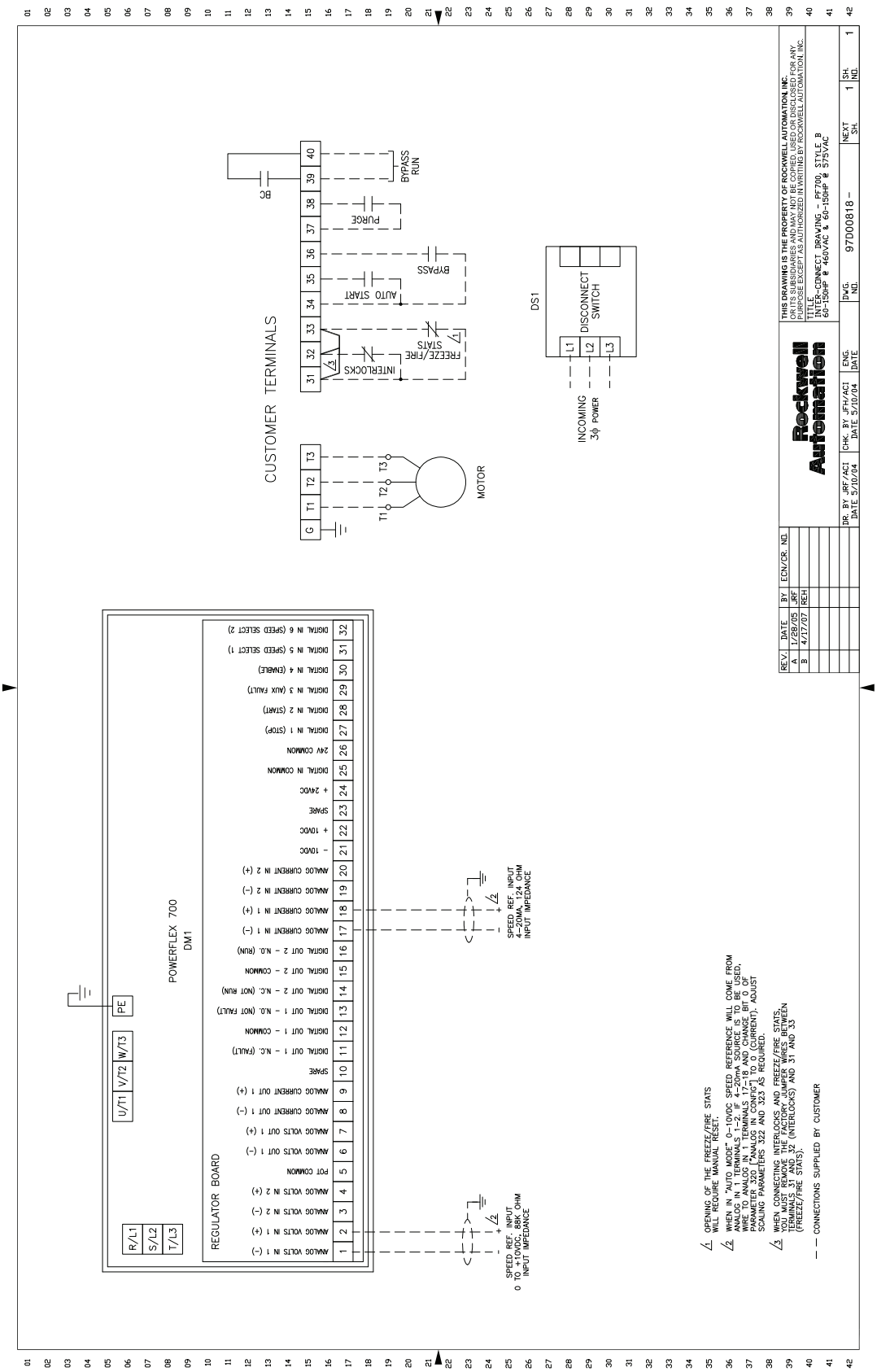
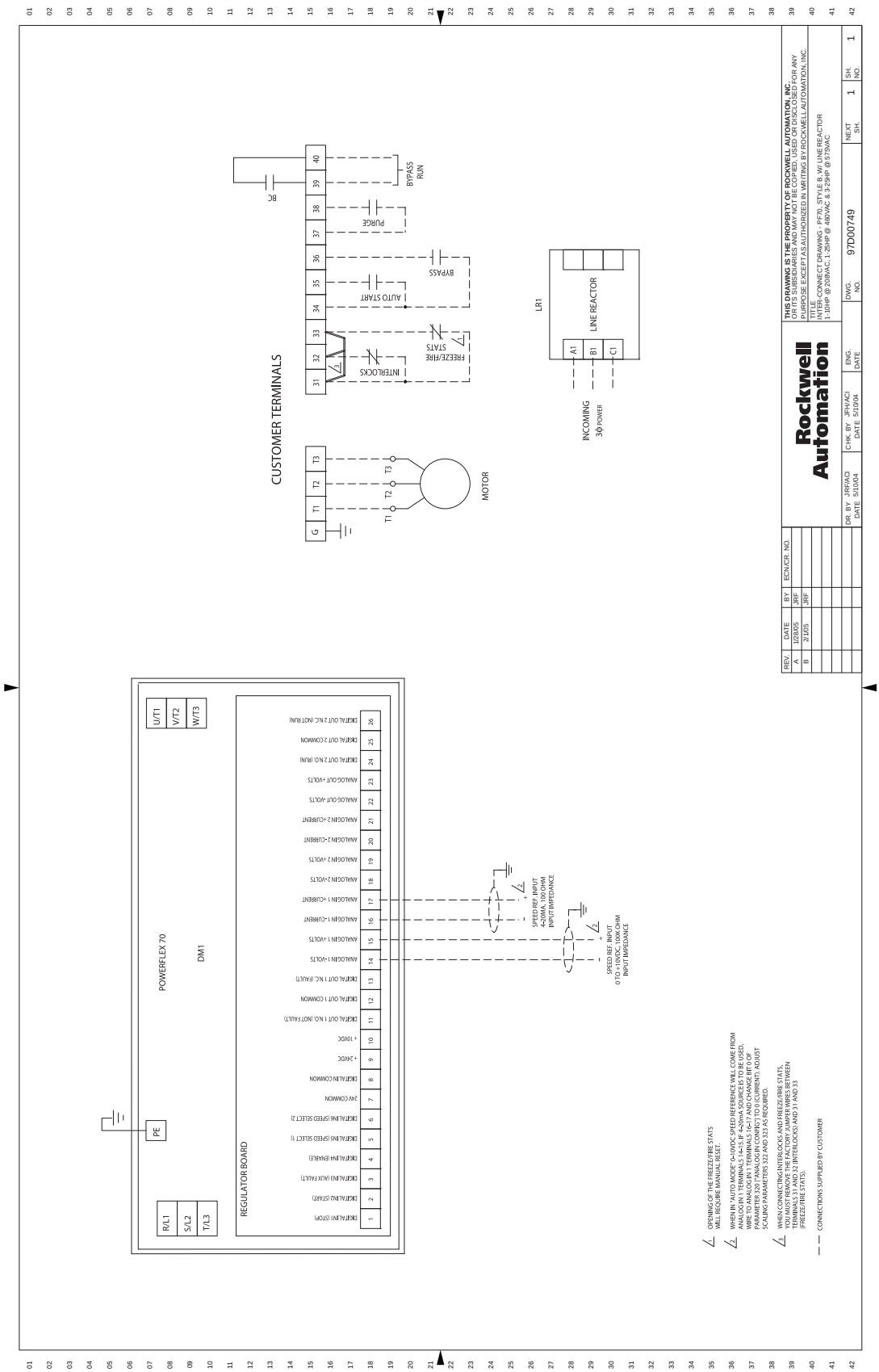


Figure 44 - 1…10 Hp, 208V AC; 1…25 Hp, 480V AC; and 3…25 Hp, 600V AC Drives with Line Reactor



Layout Drawings

Figure 45 - 1…10 Hp, 208V AC; 1…25 Hp, 480V AC; and 3…25 Hp, 600V AC Drives

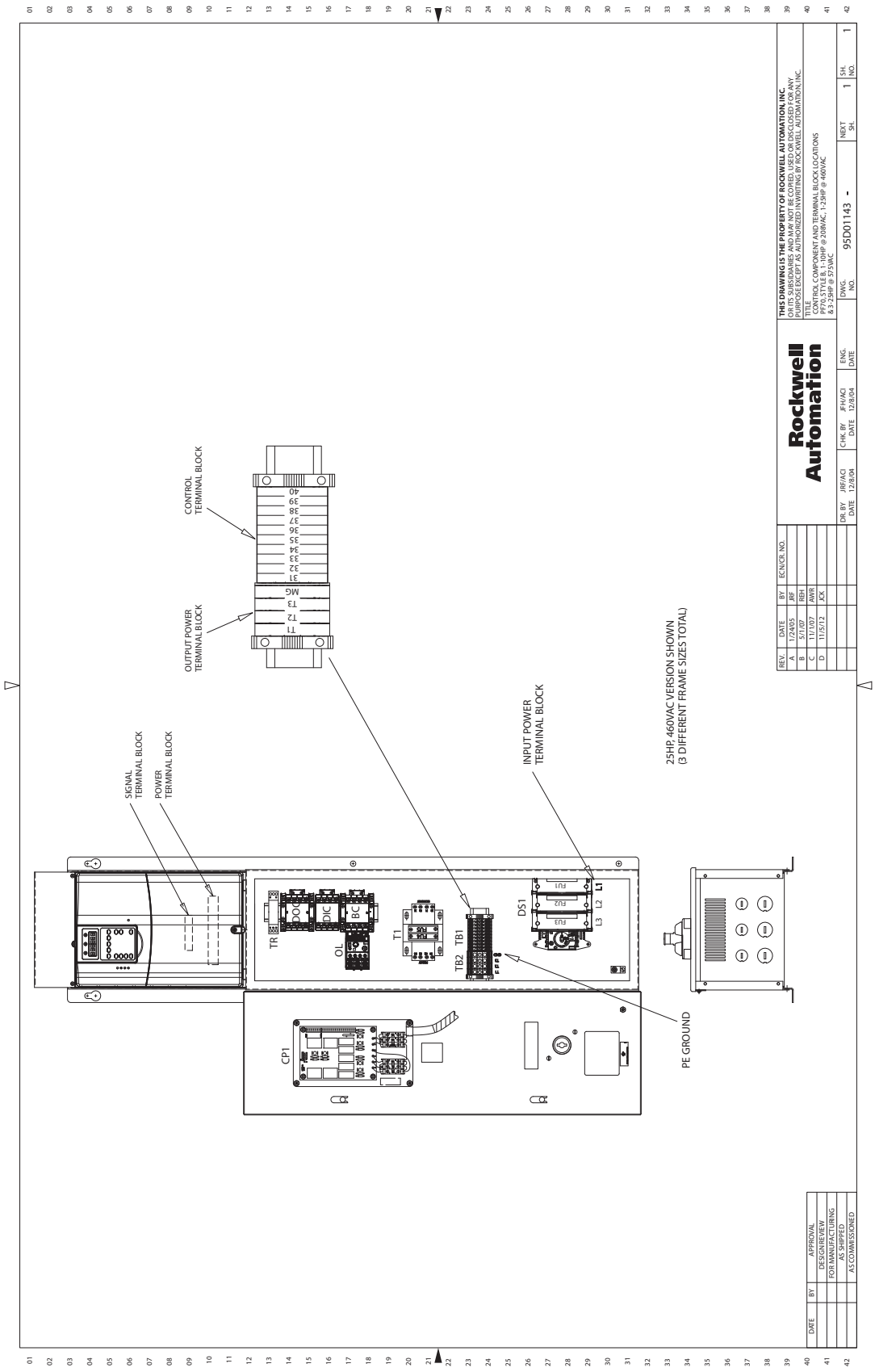


Figure 46 - 30 Hp, 480V AC and 600V AC Drives

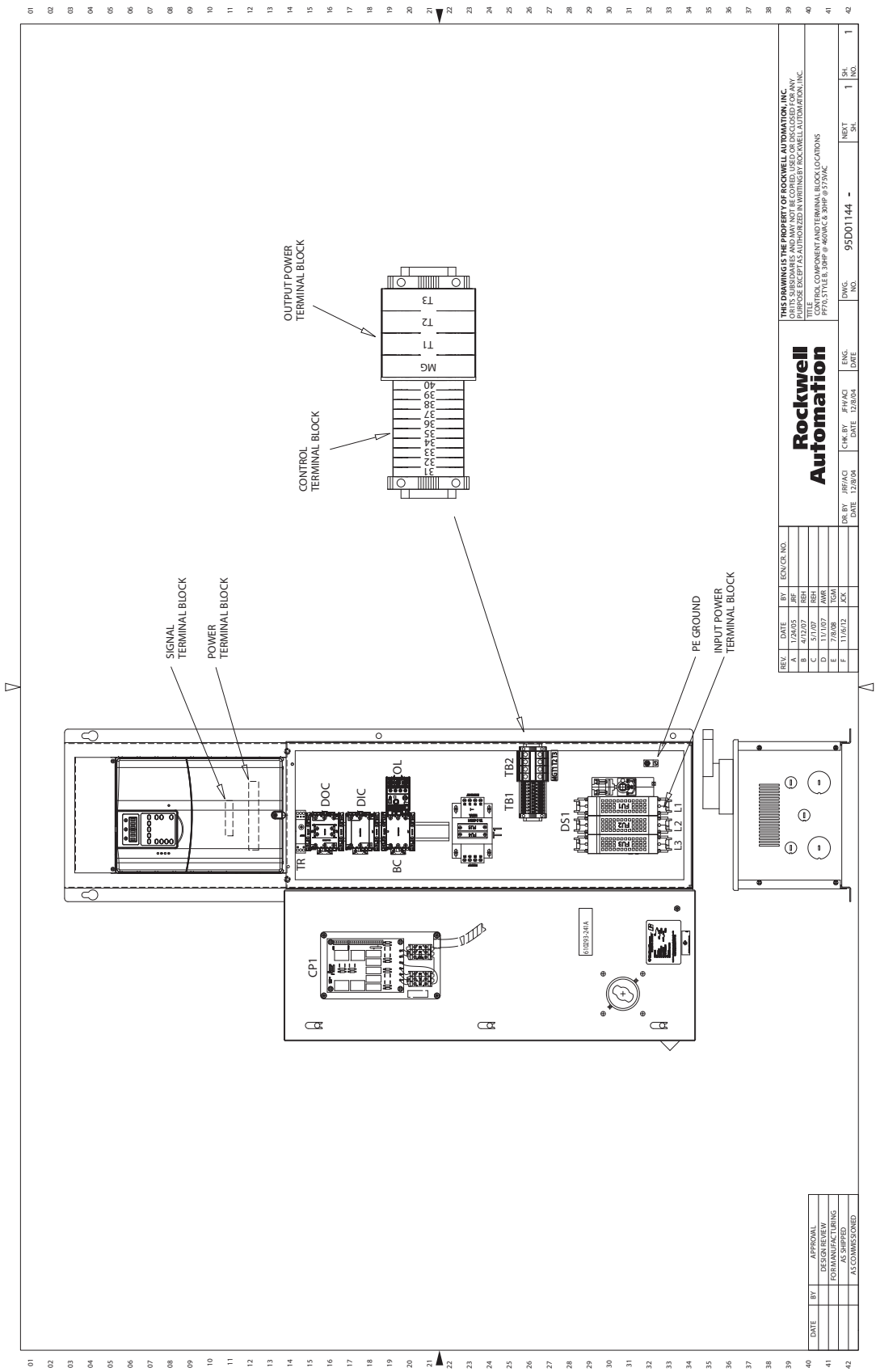


Figure 47 - 15 Hp, 208V AC; 40…50 Hp, 480V AC and 600V AC Drives

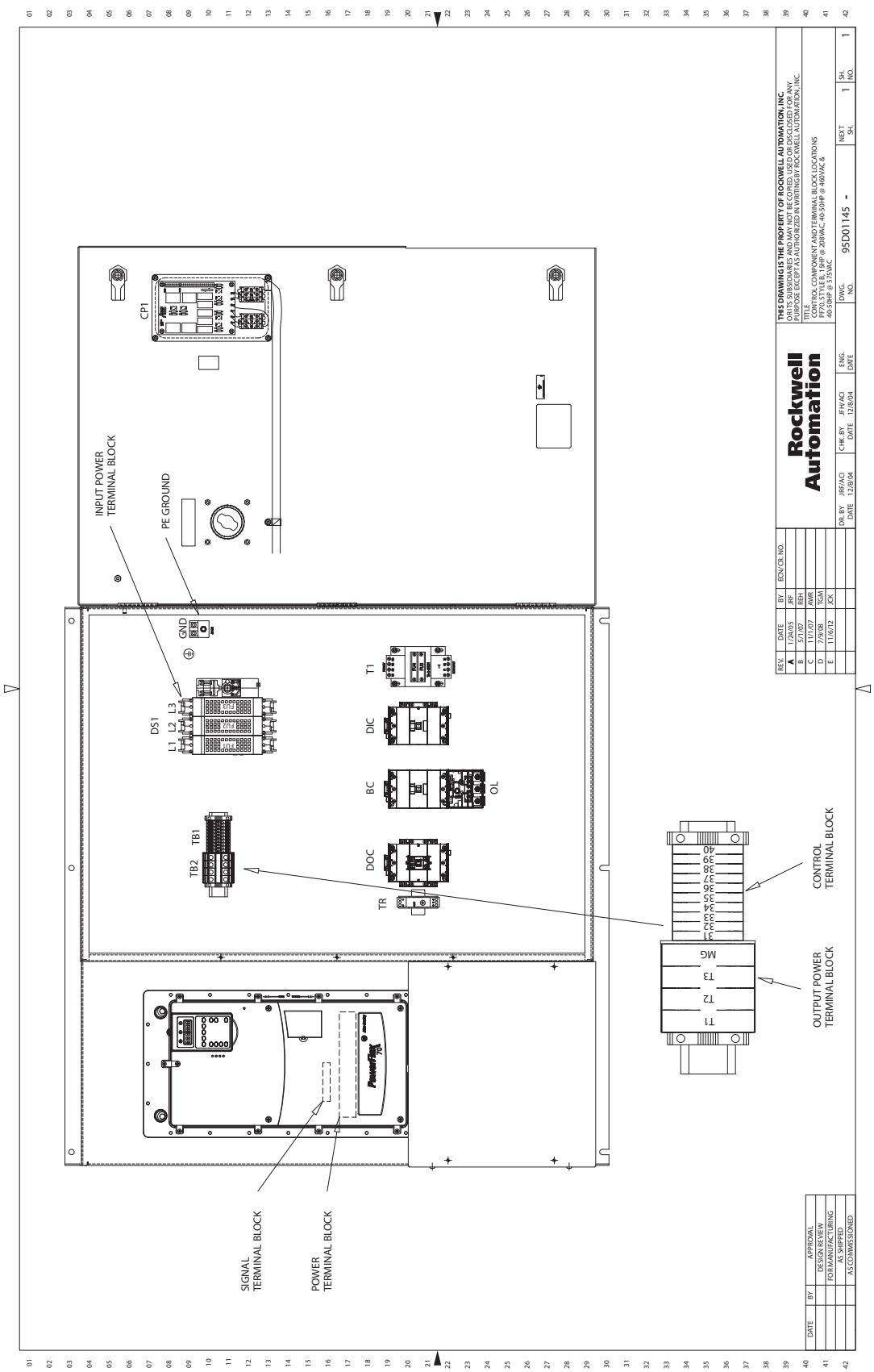


Figure 48 - 60 Hp, 480V AC and 600V AC Drives

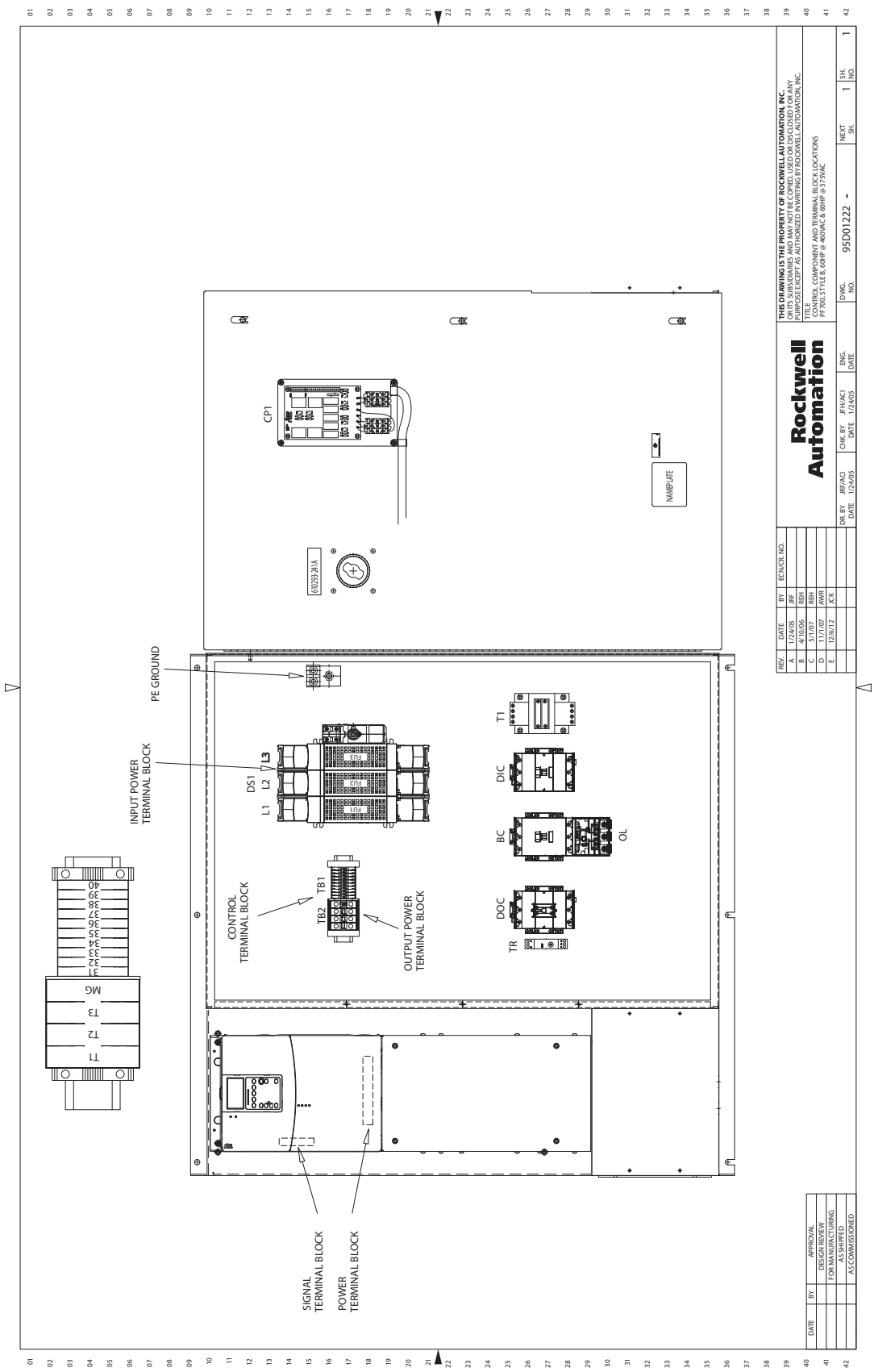


Figure 49 - 75…100 Hp, 480V AC and 600V AC Drives

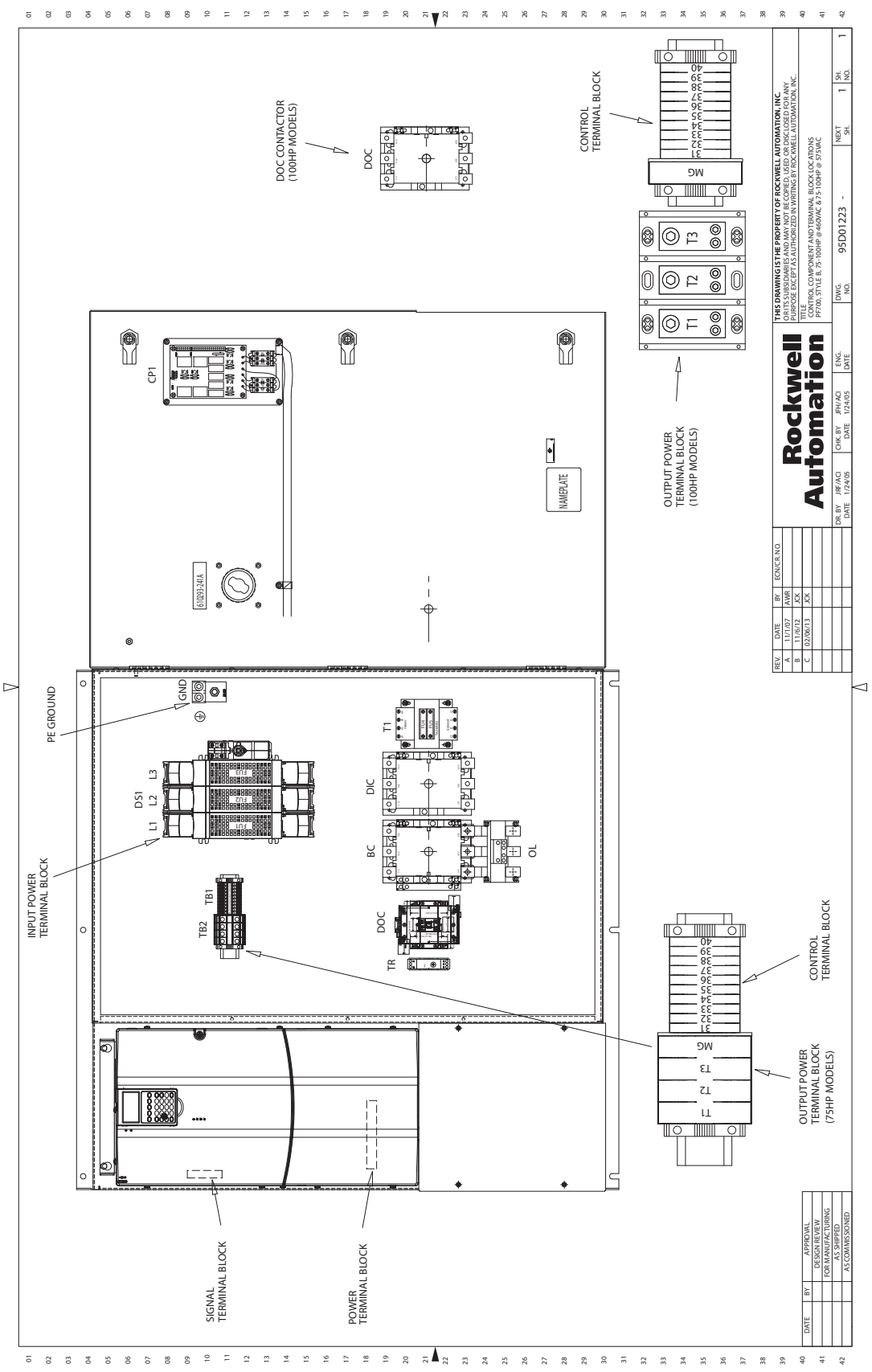


Figure 50 - 125…150 Hp, 480V AC and 600V AC Drives

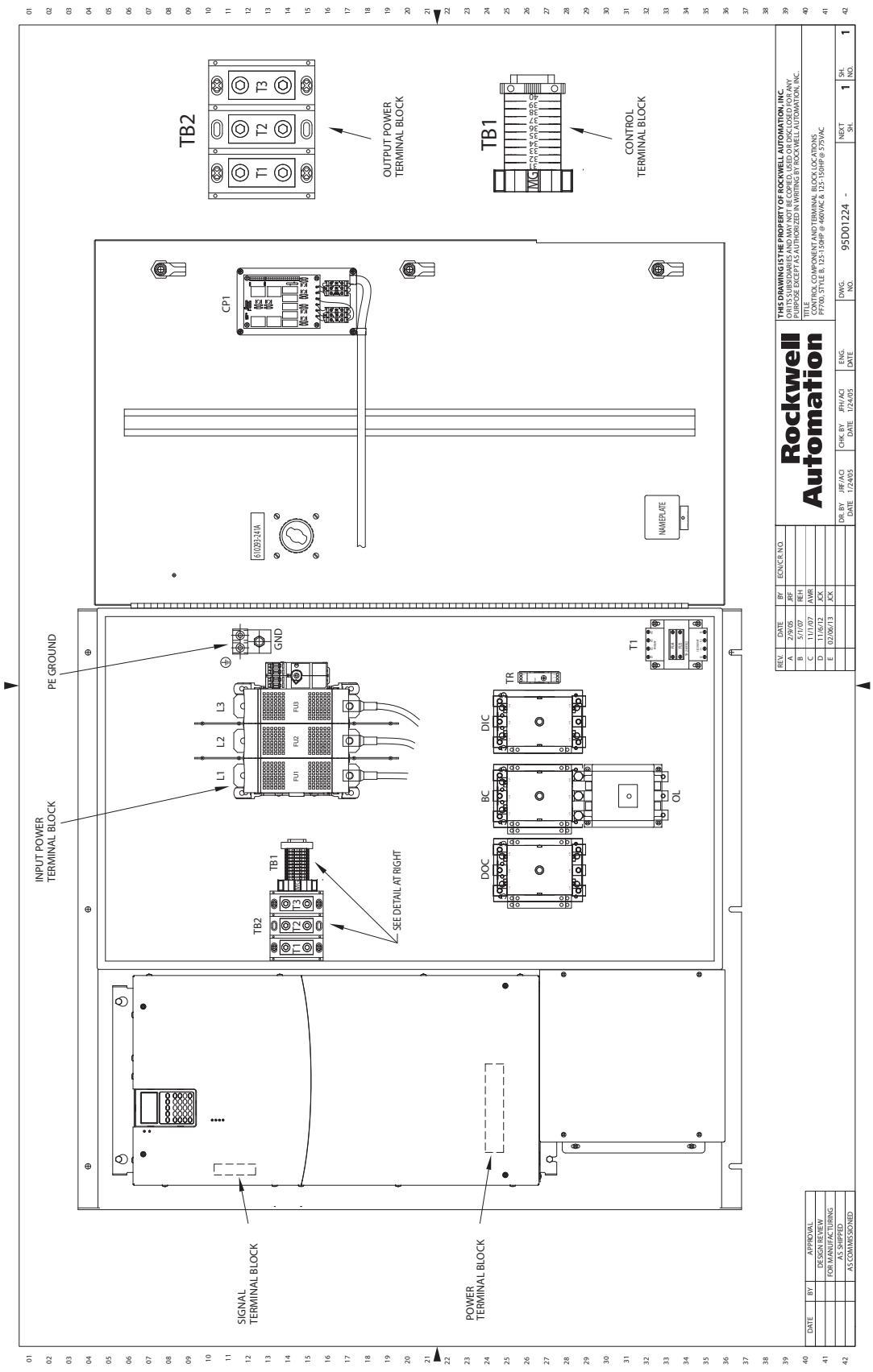


Figure 51 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 60V AC Drives with Line Reactor

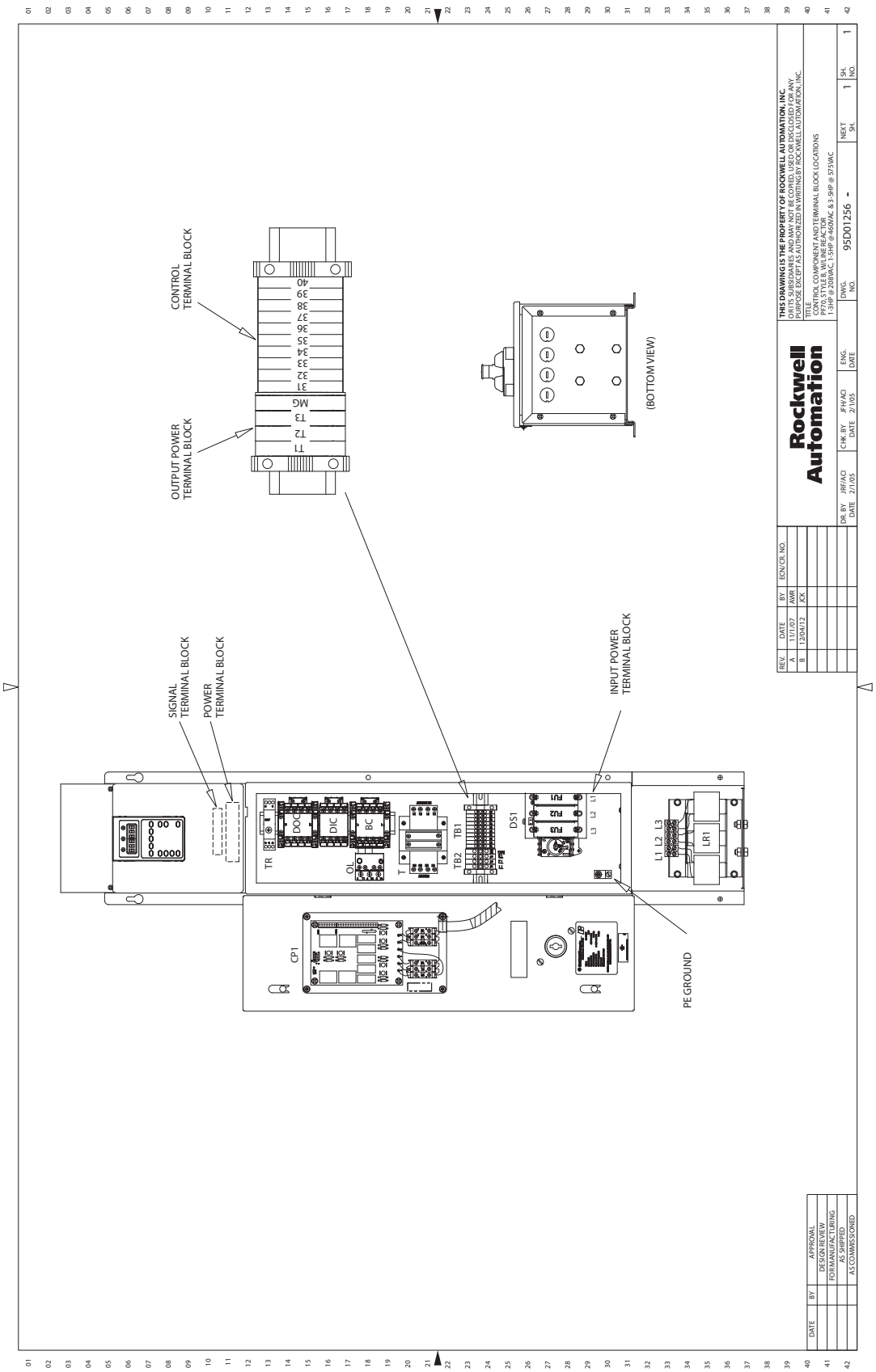


Figure 52 - 5 Hp, 208V AC; 7.5…10 Hp, 480V AC and 600V AC Drives with Line Reactor

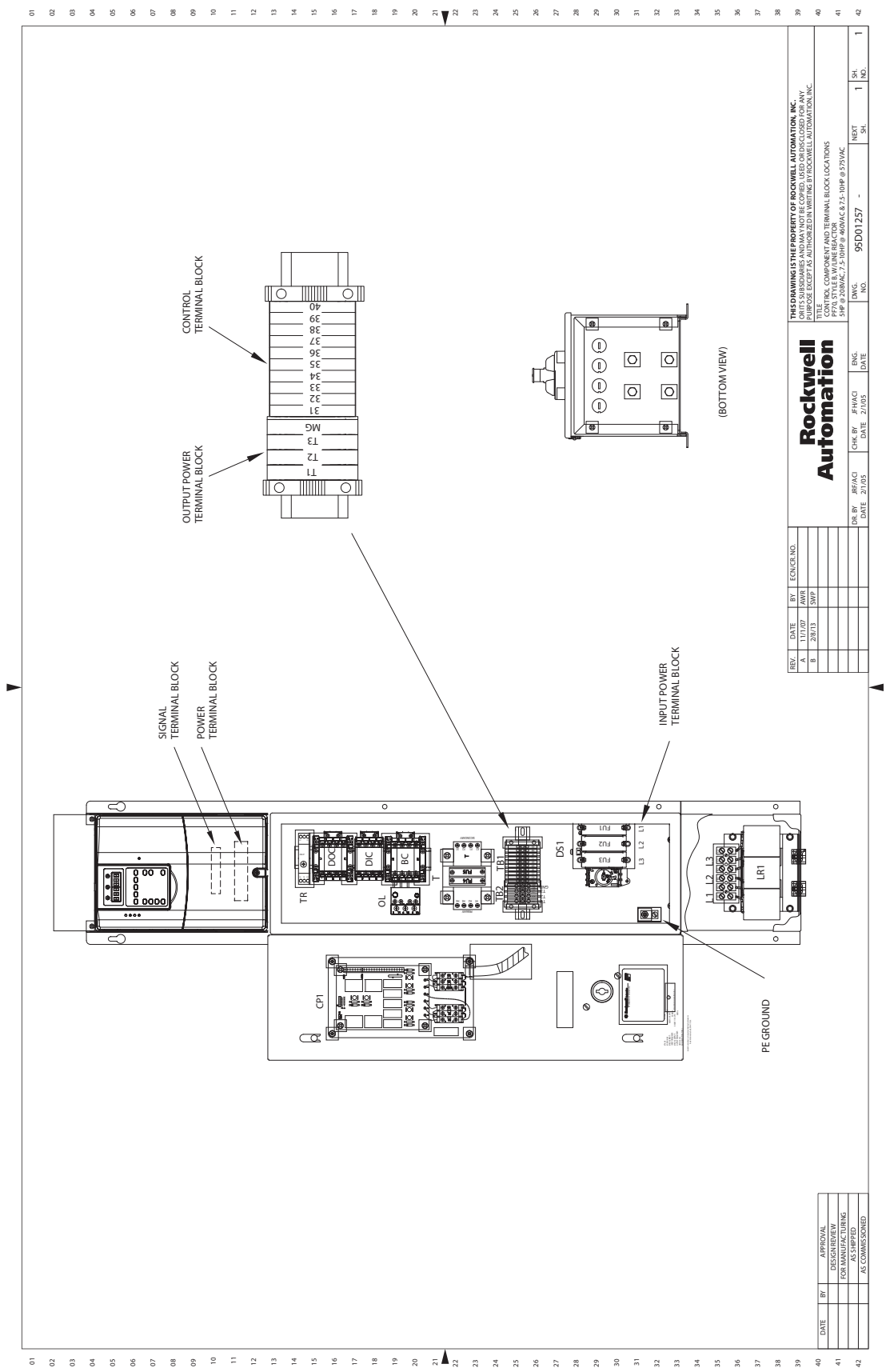
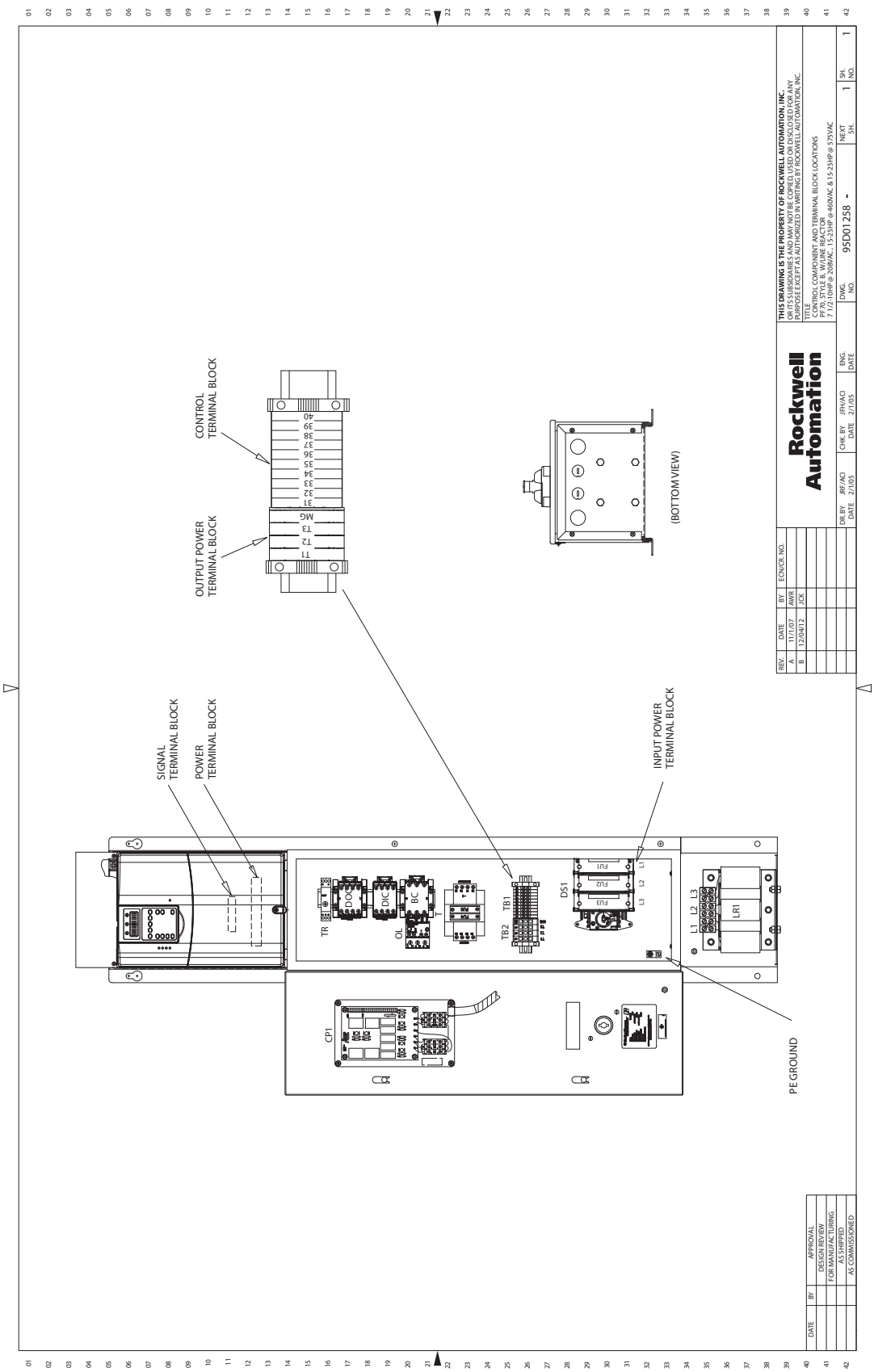


Figure 53 - 7.5…10 Hp, 208V AC; 15…25 Hp, 480V AC and 600V AC Drives with Line Reactor



Outline Drawings

Figure 54 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 600V AC Drives

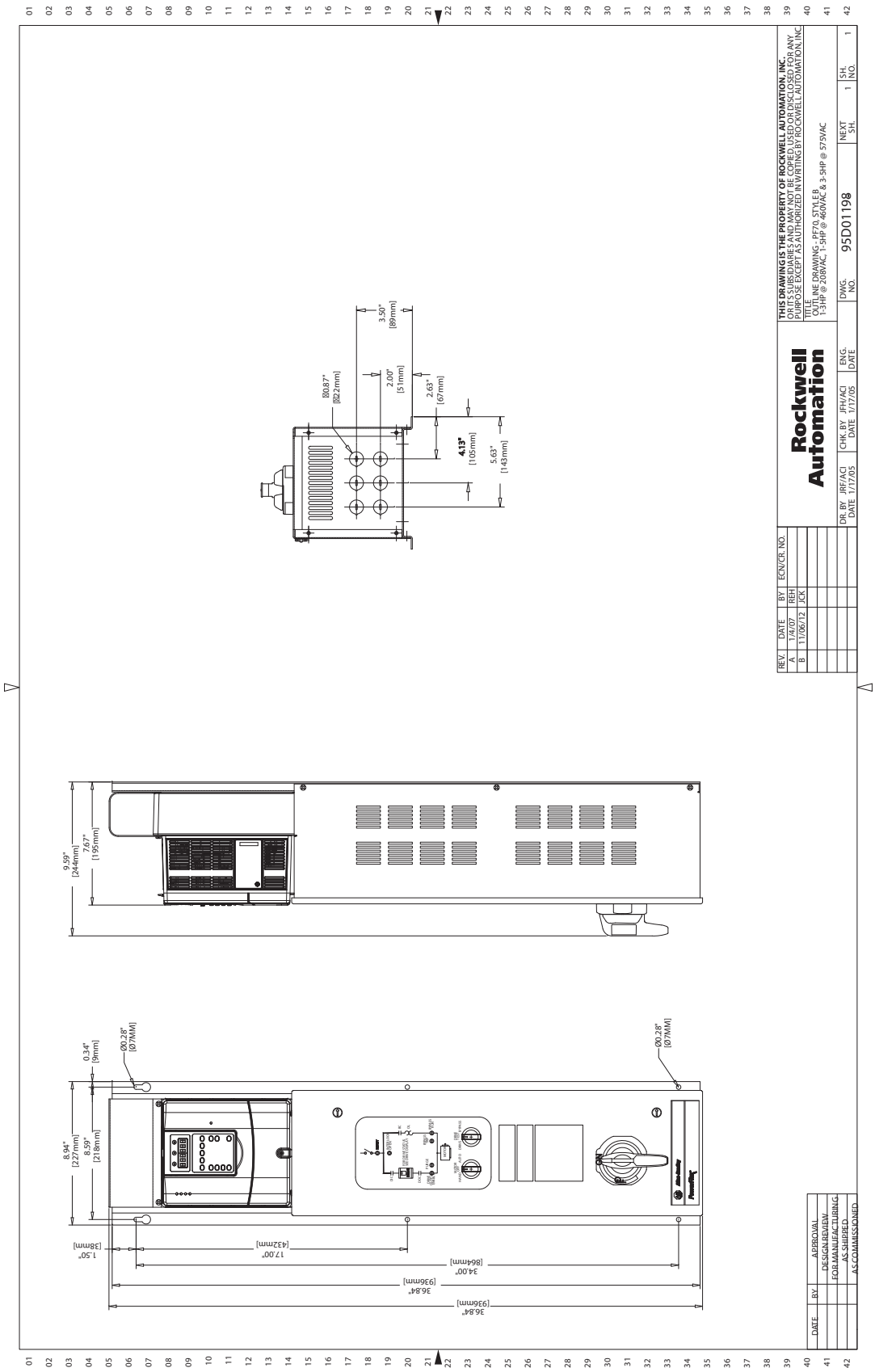


Figure 55 - 5 Hp, 208V AC; and 7.5…10 Hp, 480V AC and 600V AC Drives

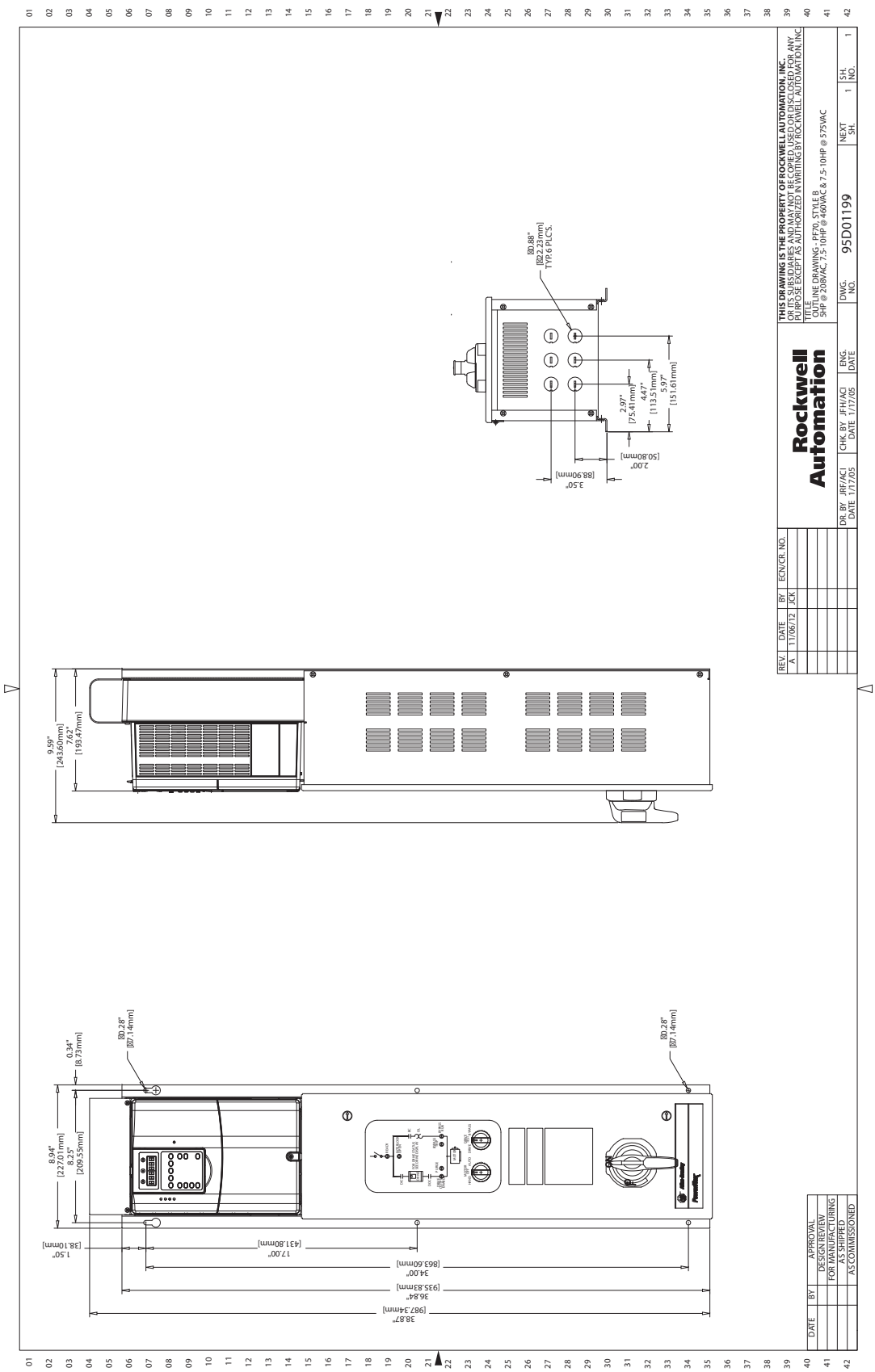


Figure 56 - 7.5…10 Hp, 208V AC; and 15…25 Hp, 480V AC and 600V AC Drives

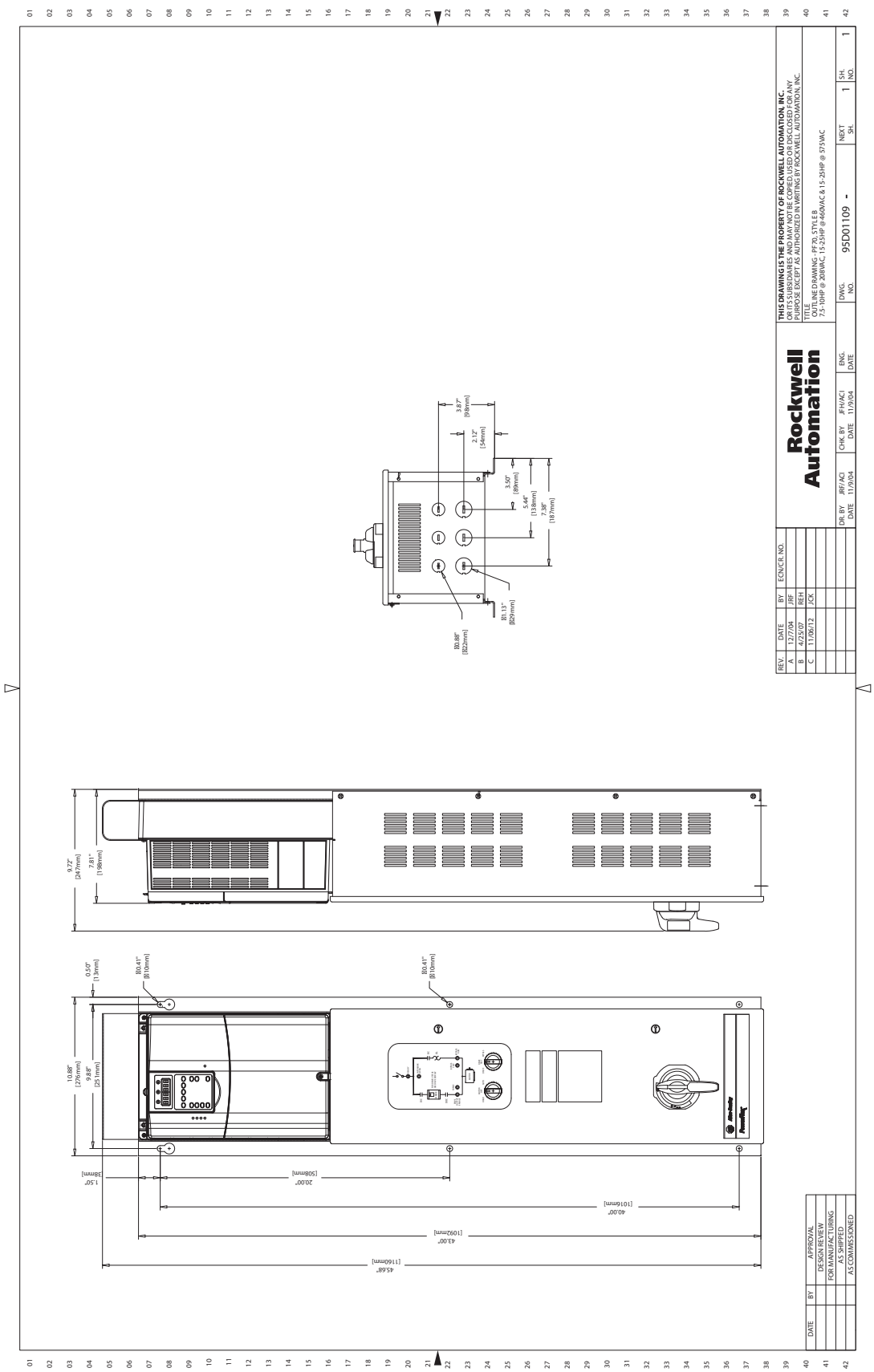


Figure 57 - 15 Hp, 208V AC; and 30 Hp, 480V AC and 600V AC Drives

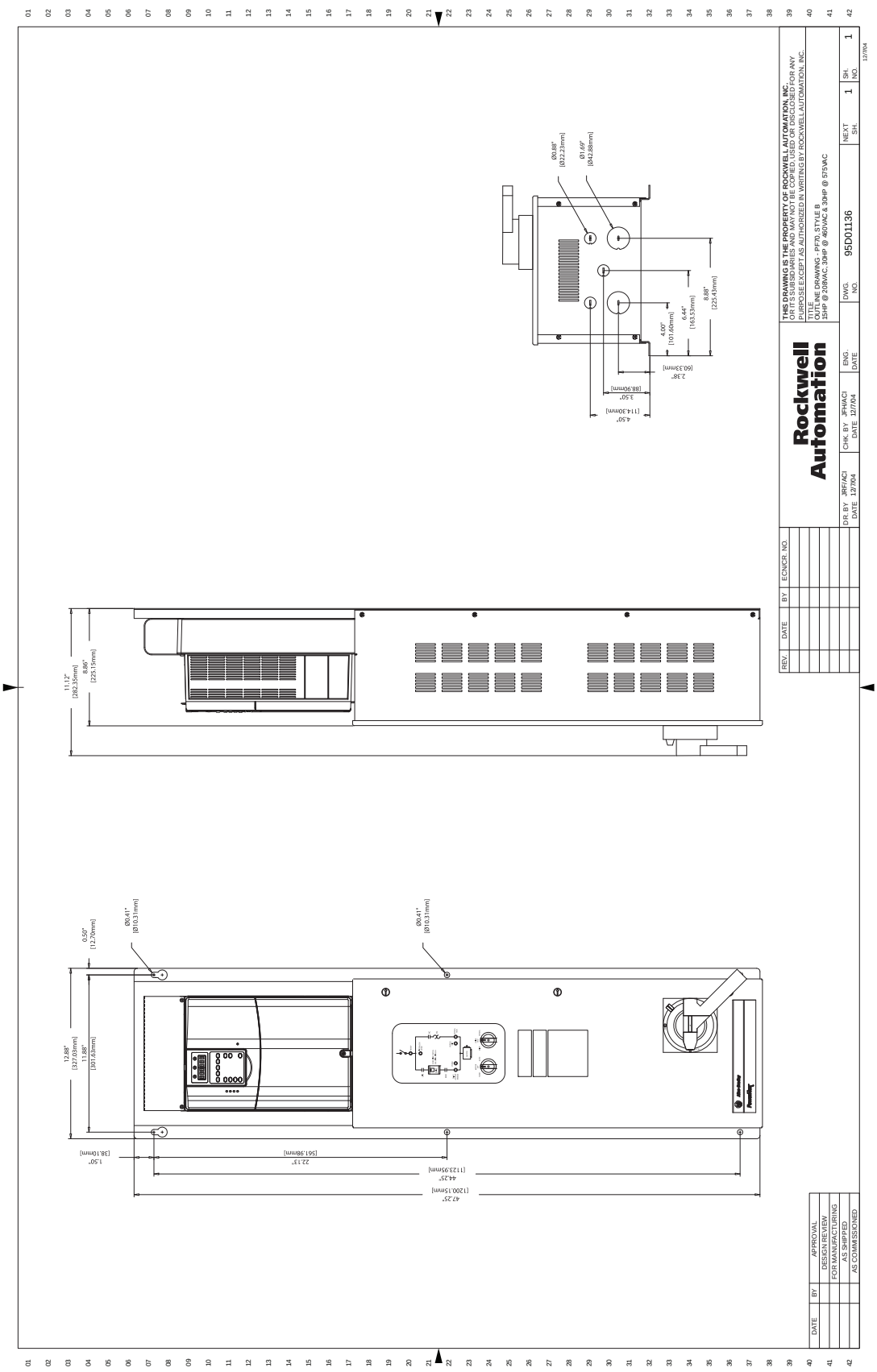


Figure 58 - 40…50 Hp, 480V AC and 600V AC Drives

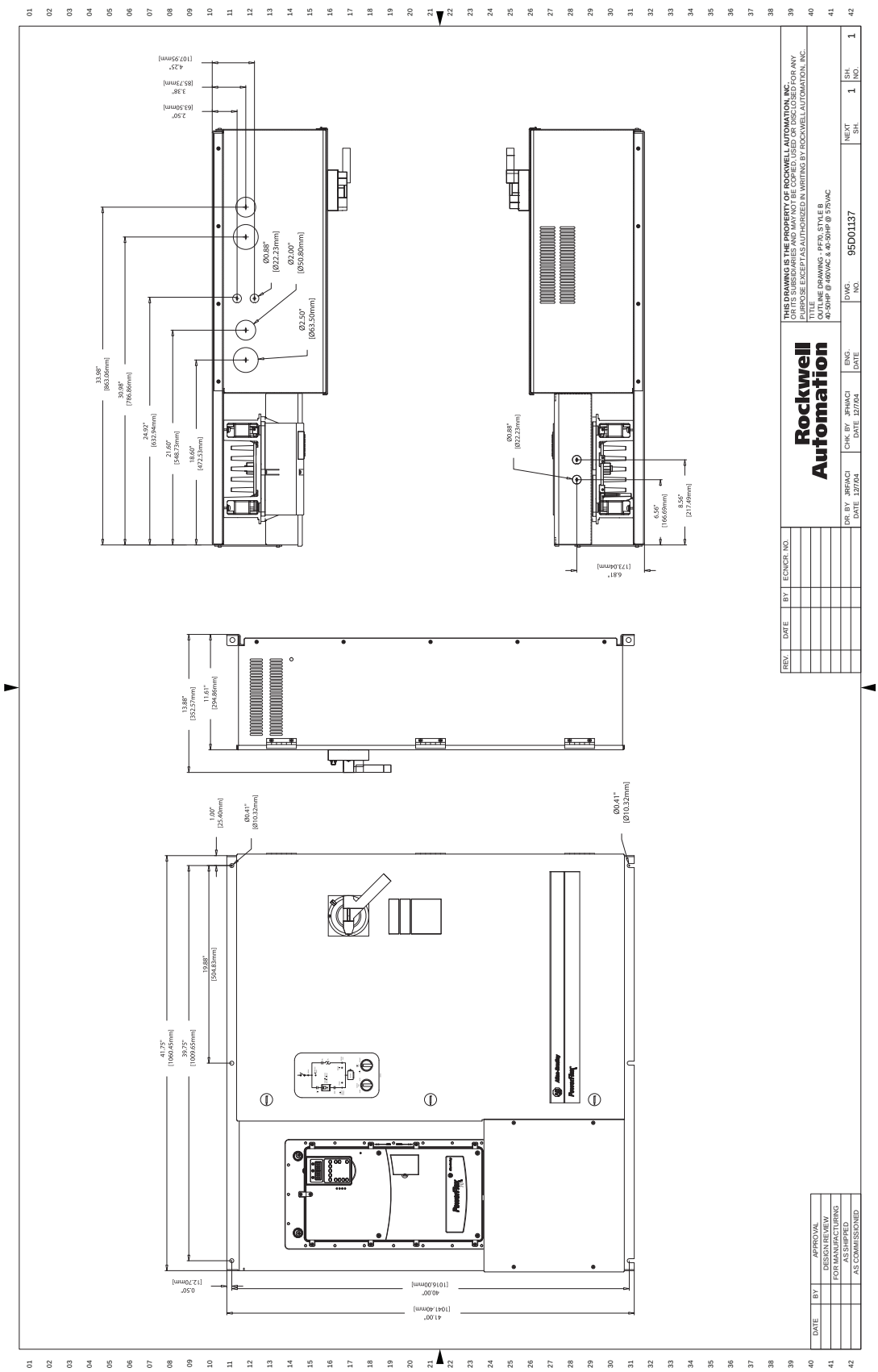


Figure 59 - 60 Hp, 480V AC and 600V AC Drives

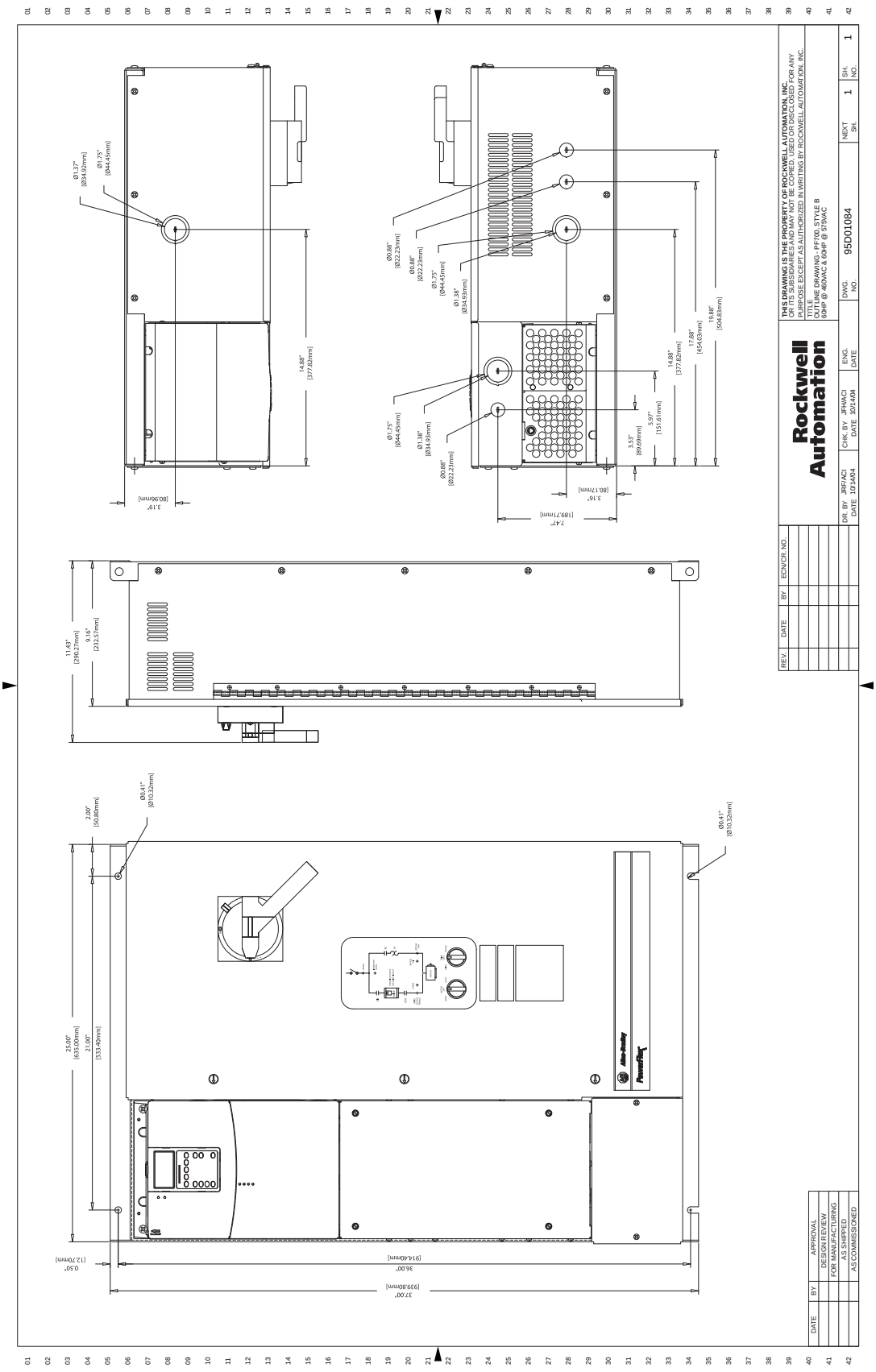


Figure 60 - 75…100 Hp, 480V AC and 600V AC Drives

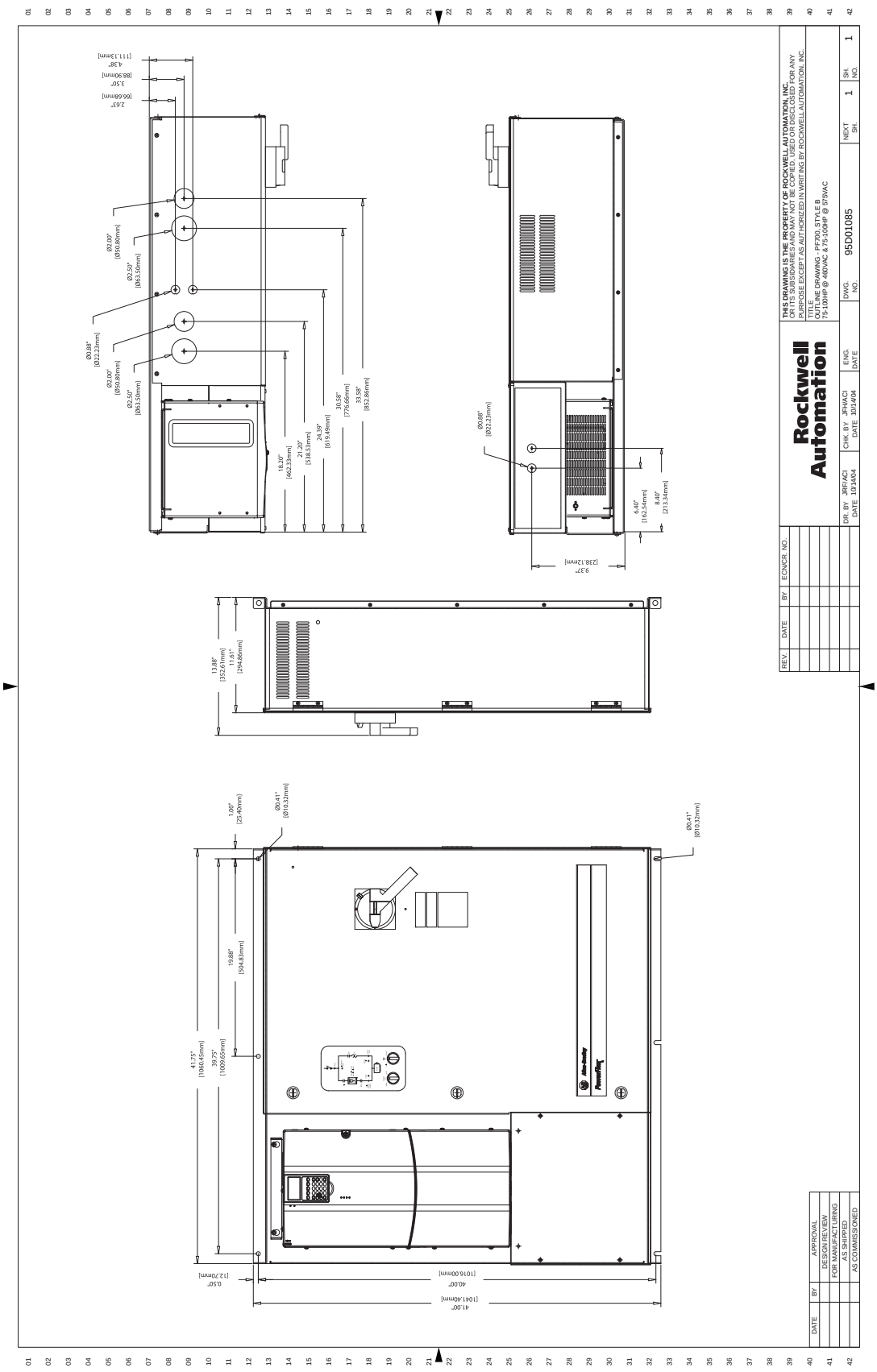


Figure 61 - 125…150 Hp, 480V AC and 600V AC Drives

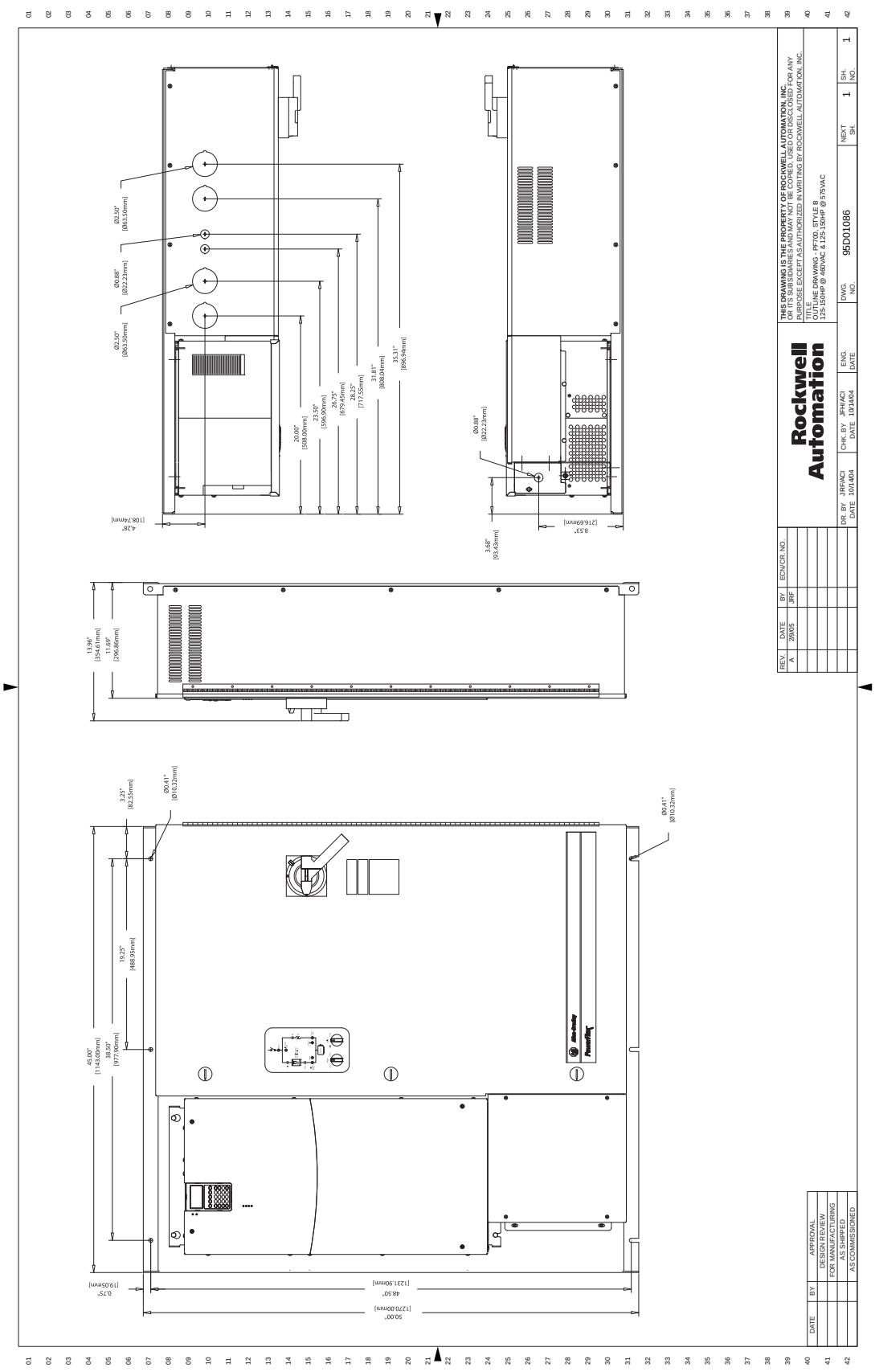


Figure 62 - 1…3 Hp, 208V AC; 1…5 Hp, 480V AC; and 3…5 Hp, 600V AC Drives with Line Reactor

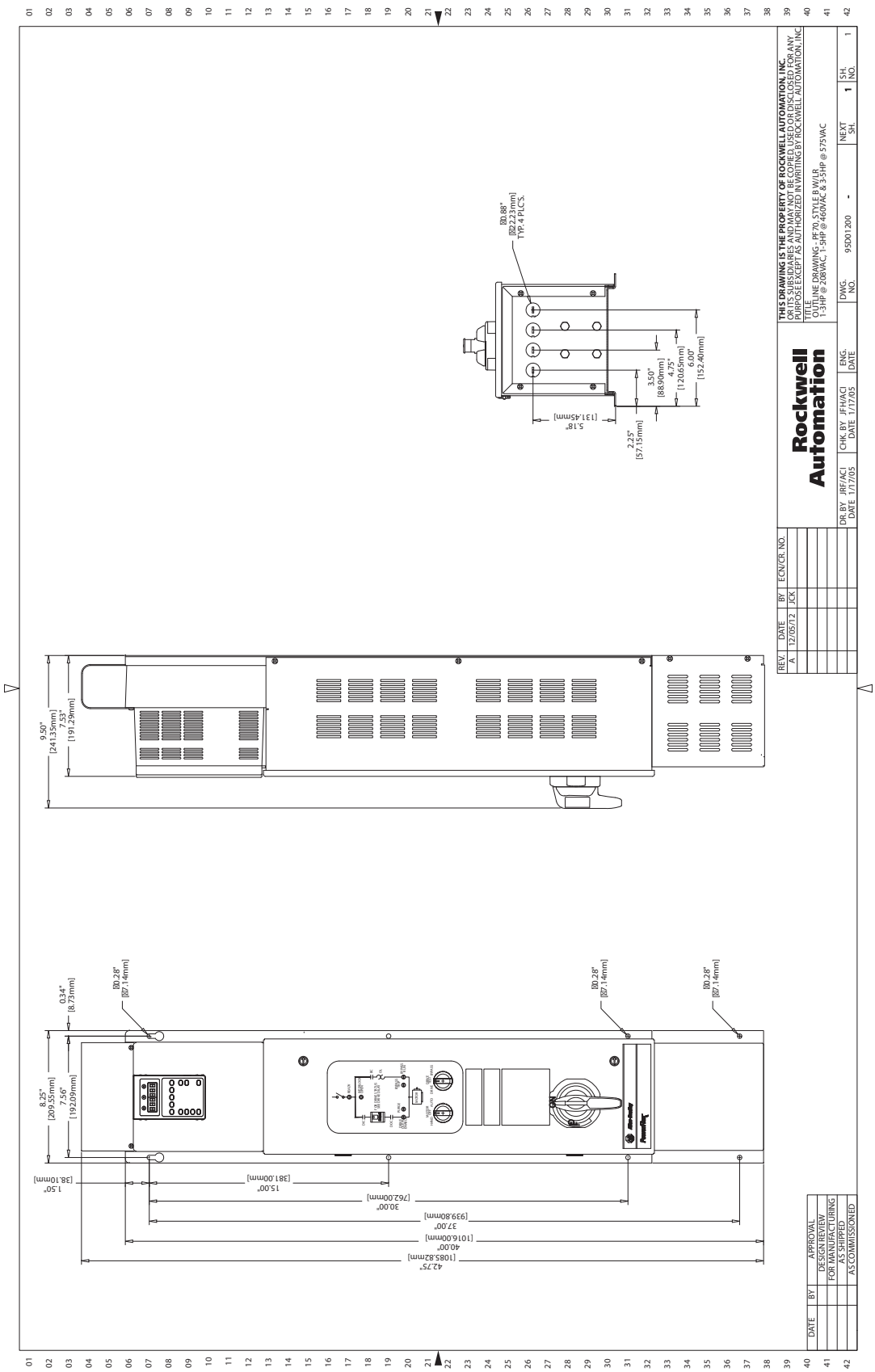


Figure 63 - 5 Hp, 208V AC; and 7.5…10 Hp, 480V AC and 600V AC Drives with Line Reactor

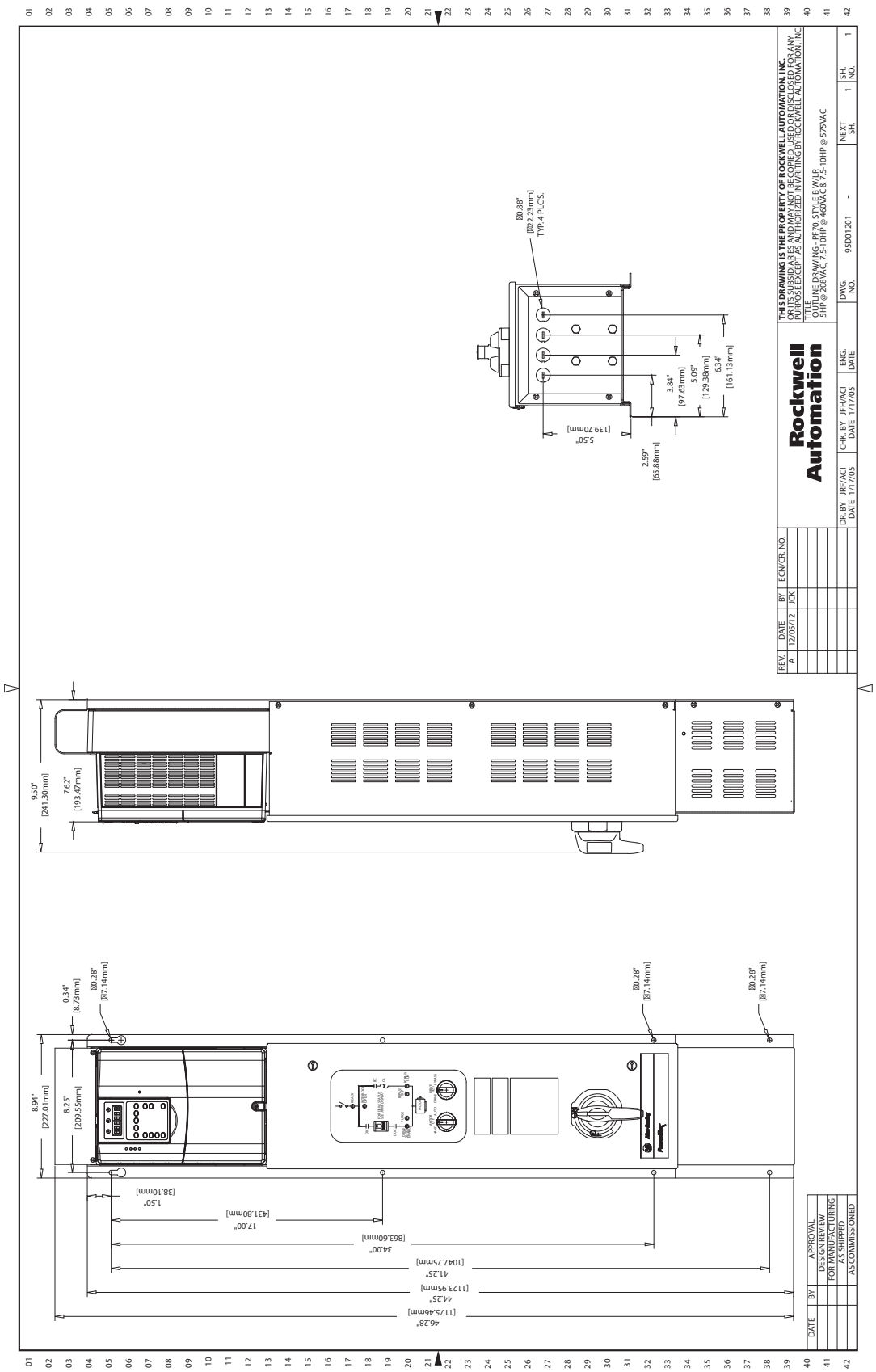
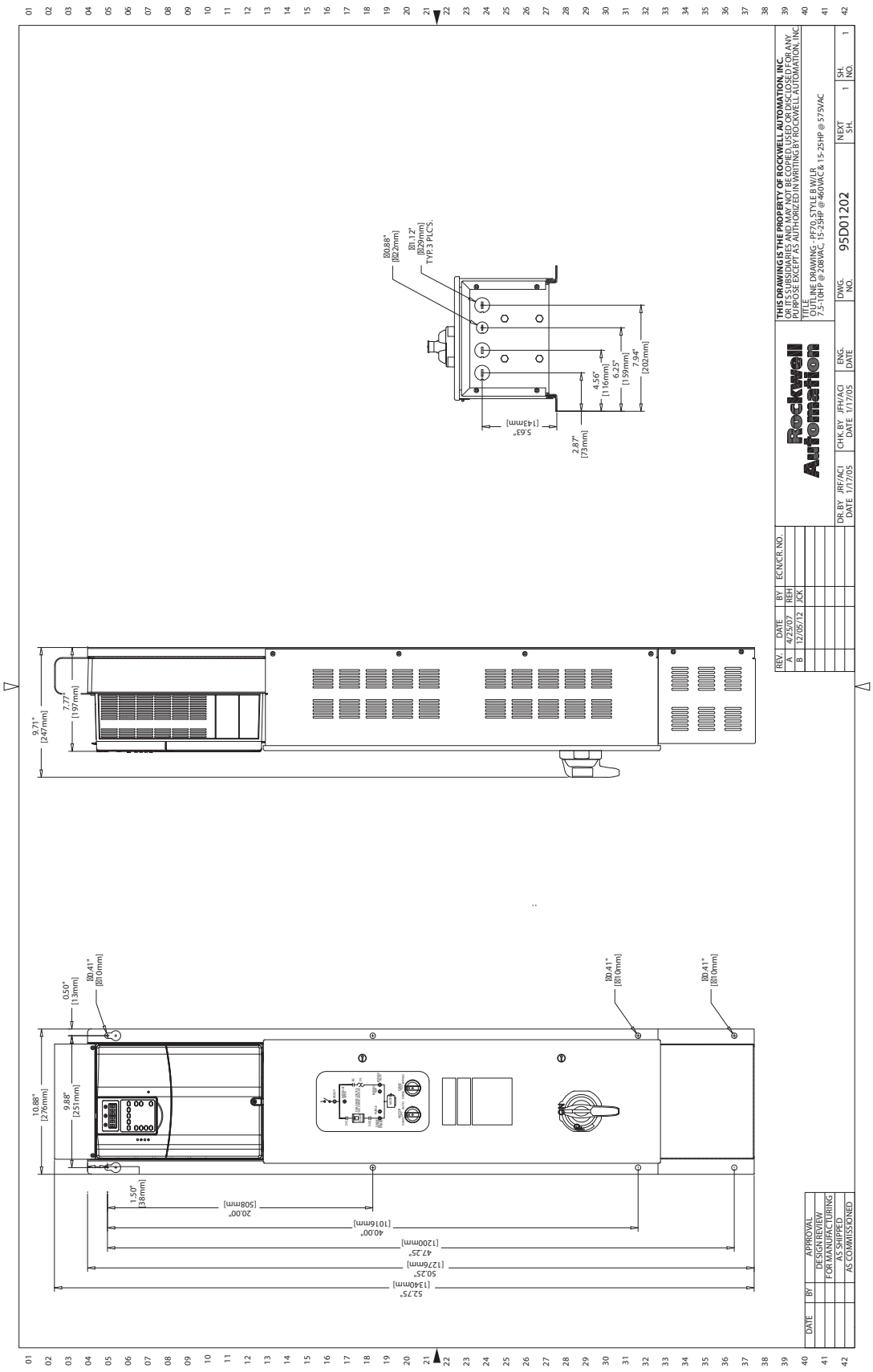


Figure 64 - 7.5…10 Hp, 208V AC; and 15…25 Hp, 480V AC and 600V AC Drives with Line Reactor



Notes:

Mechanical Installation

This chapter provides information on mounting a PowerFlex 70 and 700 package for fan and pump applications.

ATTENTION: The following information is a guide for proper installation. The Allen-Bradley Company cannot assume responsibility for the compliance or noncompliance to any code, national, local, or otherwise for the proper installation of this drive or associated equipment. A hazard of personal injury and/or equipment damage exists if codes are ignored during installation.

Topic	Page
Mounting Considerations	107
Lifting and Mounting the Drive	108
Watts Loss	109
Weights	111

Mounting Considerations

Environment

Before deciding on an installation site, verify that the PowerFlex drive packages can be kept clean, cool, and dry. The drives must be kept away from oil, coolants, or other airborne contaminants.

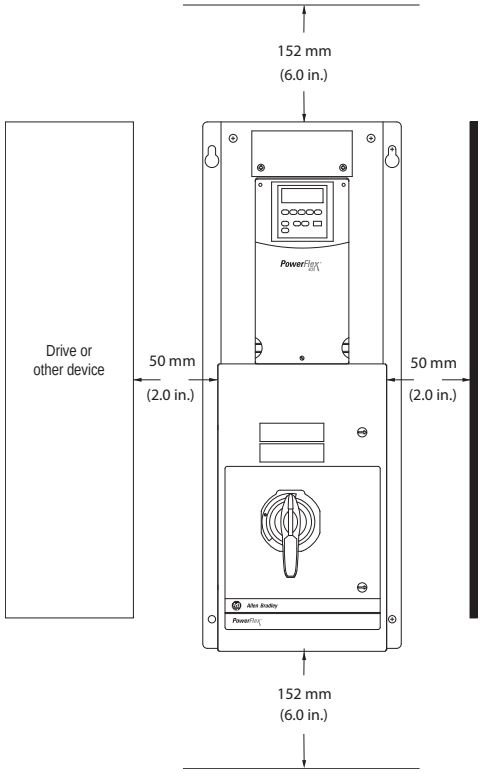
Maximum Surrounding Air Temperature

PowerFlex 70 and 700 packages for fan and pump applications are designed to operate at 0...40 °C (32...104 °F) surrounding air temperature.

Minimum Mounting Clearances

Specified vertical clearance requirements are intended to be from the drive to the closest object that can restrict airflow through the drive heat sink and chassis. The drive must be mounted in a vertical orientation as shown, and must make full contact with the mounting surface. Do not use standoffs or spacers. In addition, inlet air temperature must not exceed the product specification. See Figure 65 on page 108 for minimum mounting clearances for the drive.

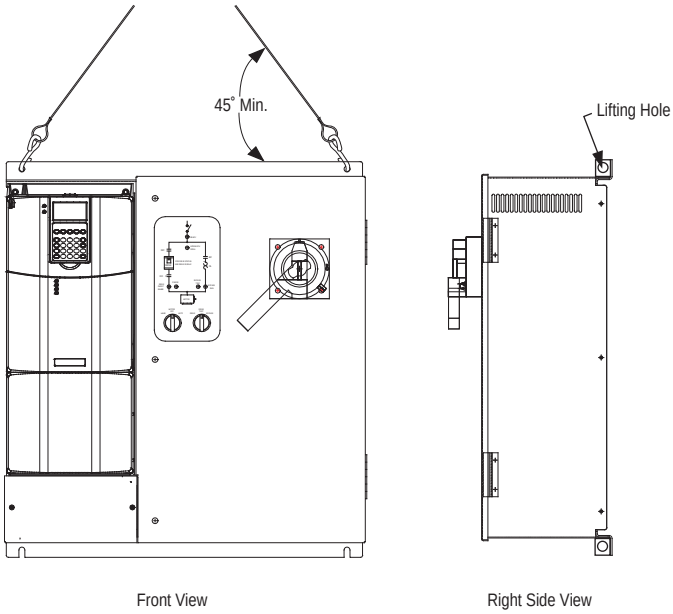
Figure 65 - Minimum Mounting Clearances



Lifting and Mounting the Drive

Do not drop or jolt the drive when moving or lifting the drive. Use a fork lift truck or similar means for lifting and transporting the drive. Use a sling that equalizes the load at the pickup points. Use a spreader bar if the angle of the sling is less than 45 degrees relative to horizontal.

Figure 66 - Lifting the Drive



Follow these steps to lift and mount the drive.

1. Attach a sling with safety hooks or clevis clamps to the two lifting holes at the top of the drive. Verify that the angle of the sling is not less than 45 degrees relative to horizontal.
2. Use an overhead or portable hoist to attach a free-fall chain to the chain secured to the drive. Take up any vertical slack in the chain.
3. Use the hoist to lift the drive from the horizontal shipping pallet.
4. Position the drive.
5. Attach the drive to a vertical surface by using the mounting holes provided. Use washers under the bolt heads.

Watts Loss

Table 18 lists watts loss data for PowerFlex 70 and 700 packages for fan and pump applications running at full load, full speed, and a factory default PWM frequency of 4 kHz.

Table 18 - Watts Loss at Full Load/Speed, 4 kHz

Drive Rating			Power Dissipation
Input Voltage	**kW**	**Hp**	**Watts**
208V AC, 3-phase	0.75	1.0	61
	1.5	2.0	77
	2.2	3.0	103
	4.0	5.0	185
	5.5	7.5	250
	7.5	10	329
	11	15	436

Table 18 - Watts Loss at Full Load/Speed, 4 kHz (Continued)

Drive Rating			Power Dissipation
Input Voltage	**kW**	**Hp**	**Watts**
480V AC, 3-phase	0.75	1.0	57
	1.5	2.0	75
	2.2	3.0	99
	4.0	5.0	138
	5.5	7.5	178
	7.5	10	235
	11	15	350
	15	20	486
	18.5	25	414
	22	30	448
	30	40	561
	37	50	700
	45	60	940
	55	75	1117
	75	100	1489
	90	125	1855
	110	150	2214
	132	200	2512
600V AC, 3-phase	2.2	3.0	89
	4.0	5.0	128
	5.5	7.5	168
	7.5	10	226
	11	15	340
	15	20	433
	18.5	25	334
	22	30	365
	30	40	452
	37	50	571
	45	60	835
	55	75	1371
	75	100	1884
	90	125	1910
	110	150	2290

Weights

Table 19 through Table list approximate weights for PowerFlex 70 and 700 drive packages for fan and pump applications.

Table 19 - Weights for Main Input Disconnect Packages (style A)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
208V AC	0.75	1	No	11.3	(25)
	1.5	2		11.3	(25)
	2.2	3		11.3	(25)
	4	5		15.4	(34)
	5.5	7.5		18.1	(40)
	7.5	10		18.1	(40)
	11	15		18.5	(41)
	0.75	1	Yes	17.6	(39)
	1.5	2		17.6	(39)
	2.2	3		17.6	(39)
	4	5		22.6	(50)
	5.5	7.5		28.1	(62)
	7.5	10		28.1	(62)

Table 19 - Weights for Main Input Disconnect Packages (style A) (Continued)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
480V AC	0.75	1.0	No	11.3	(25)
	1.5	2.0		11.3	(25)
	2.2	3.0		11.3	(25)
	4.0	5.0		11.3	(25)
	5.5	7.5		15.4	(34)
	7.5	10		15.4	(34)
	11	15		18.1	(40)
	15	20		18.1	(40)
	18.5	25		18.1	(40)
	22	30		22.6	(50)
	30	40		31.2	(69)
	37	50		31.2	(69)
	45	60		68.0	(150)
	55	75		68.0	(150)
	75	100		68.0	(150)
	90	125		176.9	(390)
	110	150		176.9	(390)
	132	200		176.9	(390)
	0.75	1.0	Yes	17.6	(39)
	1.5	2.0		17.6	(39)
	2.2	3.0		17.6	(39)
	4.0	5.0		17.6	(39)
	5.5	7.5		22.6	(50)
	7.5	10		22.6	(50)
	11	15		28.1	(62)
	15	20		28.1	(62)
	18.5	25		28.1	(62)

Table 19 - Weights for Main Input Disconnect Packages (style A) (Continued)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
600V AC	2.2	3.0	No	11.3	(25)
	4.0	5.0		11.3	(25)
	5.5	7.5		15.4	(34)
	7.5	10		15.4	(34)
	11	15		18.1	(40)
	15	20		18.1	(40)
	18.5	25		18.1	(40)
	22	30		22.6	(50)
	30	40		31.2	(69)
	37	50		31.2	(69)
	45	60		68.0	(150)
	55	75		68.0	(150)
	75	100		68.0	(150)
	90	125		176.9	(390)
	110	150		176.9	(390)
	2.2	3.0	Yes	17.6	(39)
	4.0	5.0		17.6	(39)
	5.5	7.5		22.6	(50)
	7.5	10		22.6	(50)
	11	15		28.1	(62)
	15	20		28.1	(62)
	18.5	25		28.1	(62)

Table 20 - Weights for Three-contactor Full-feature Bypass with Disconnect Packages (style B)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
208V AC	0.75	1	No	15.8	(35)
	1.5	2		15.8	(35)
	2.2	3		15.8	(35)
	4	5		21.3	(47)
	5.5	7.5		27.2	(60)
	7.5	10		27.2	(60)
	11	15		27.2	(60)
	0.75	1	Yes	22.2	(49)
	1.5	2		22.2	(49)
	2.2	3		22.2	(49)
	4	5		29.4	(65)
	5.5	7.5		37.6	(83)
	7.5	10		37.6	(83)

Table 20 - Weights for Three-contactor Full-feature Bypass with Disconnect Packages (style B) (Continued)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
480V AC	0.75	1.0	No	15.8	(35)
	1.5	2.0		15.8	(35)
	2.2	3.0		15.8	(35)
	4.0	5.0		15.8	(35)
	5.5	7.5		21.3	(47)
	7.5	10		21.3	(47)
	11	15		27.2	(60)
	15	20		27.2	(60)
	18.5	25		27.2	(60)
	22	30		43.0	(95)
	30	40		43.0	(95)
	37	50		43.0	(95)
	45	60		108.8	(240)
	55	75		113.3	(250)
	75	100		122.4	(270)
	90	125		190.5	(420)
	110	150		190.5	(420)
	0.75	1.0	Yes	22.2	(49)
	1.5	2.0		22.2	(49)
	2.2	3.0		22.2	(49)
	4.0	5.0		22.2	(49)
	5.5	7.5		29.4	(65)
	7.5	10		29.4	(65)
	11	15		37.6	(83)
	15	20		37.6	(83)
	18.5	25		37.6	(83)

Table 20 - Weights for Three-contactor Full-feature Bypass with Disconnect Packages (style B) (Continued)

Input Voltage	kW	Hp	Input Line Reactor	Weight	
				kg	(lb)
600V AC	2.2	3.0	No	15.8	(35)
	4.0	5.0		15.8	(35)
	5.5	7.5		21.3	(47)
	7.5	10		21.3	(47)
	11	15		27.2	(60)
	15	20		27.2	(60)
	18.5	25		27.2	(60)
	22	30		43.0	(95)
	30	40		43.0	(95)
	37	50		43.0	(95)
	45	60		108.8	(240)
	55	75		113.3	(250)
	75	100		122.4	(270)
	90	125		190.5	(420)
	110	150		190.5	(420)
	2.2	3.0	Yes	22.2	(49)
	4.0	5.0		22.2	(49)
	5.5	7.5		29.4	(65)
	7.5	10		29.4	(65)
	11	15		37.6	(83)
	15	20		37.6	(83)
	18.5	25		37.6	(83)

Technical Specifications

Environmental Specifications

This appendix lists the environmental specifications for the drives. For all other specifications, refer to the user manual for the drive listed in the table below.

Category	Attribute	Value
Environment	Altitude	1000 m (3300 ft) max without derating
	Surrounding air temperature without derating	0 . . . 40 °C (32 . . . 104 °F)
	Storage temperature (all const.)	-40 . . . 70 °C (-40 . . . 158 °F)
	Relative humidity	5 . . . 95% noncondensing
	Shock	15 G peak for 11 ms duration (±1.0 ms)
	Vibration	0.152 mm (0.006 in.) displacement, 1 G peak, 5.5 Hz
	Surrounding environment Pollution degree: Pollution degree 1 and 2 Pollution degree 3 and 4 See Table 21 on page 117 for descriptions of pollution degree rating.	 All enclosures are acceptable for pollution degree 1 and 2. An enclosure that meets or exceeds IP54, NEMA/UL Type 12, is required for pollution degree 3 and 4.
Other specifications	For other specifications, refer to the PowerFlex 70 Adjustable Frequency AC Drives User Manual, publication 20A-UM001, or the PowerFlex 700 Adjustable Frequency AC Drive User Manual, publication 20B-UM001.	

Table 21 - Pollution Degree Ratings According to EN 61800-5-1

Pollution Degree	Description
1	No pollution or only dry non-conductive pollution occurs. The pollution has no influence.
2	Normally only non-conductive pollution occurs. Occasionally a temporary conductivity, caused by condensation, is expected when the drive is out of operation.
3	Conductive pollution or dry non-conductive pollution occurs, which becomes conductive due to condensation, and is expected.
4	The pollution generates persistent conductivity caused, for example, by conductive dust, rain, or snow.

Fuse, Circuit Breaker, and Short Circuit Current Specifications

For fuse, circuit breaker, and short circuit current rating specifications for the packaged fan and pump applications, refer to PowerFlex 70 and 700 Packages for Fan and Pump Applications Product Information, publication 21VW-PC001.

Notes:

Replacement Parts

Main Input Disconnect Package (style A)

Table 22 provides a list of replacement part numbers for the main input disconnect package (style A).

Table 22 - Main Input Disconnect Package Replacement Parts (style A)

Description	Designation	Voltage	Hp	Part No.	Manufacturer
Disconnect switch	DSI	208V AC	1…5	194R-J30-1753	Allen-Bradley
			7.5…10	194R-J60-1753	
			15	194R-J100-1753	
		480V AC	1…10	194R-J30-1753	
			15…25	194R-J60-1753	
			30…50	194R-J100-1753	
			60…100	194R-J200-1753	
			125…200	194R-J400-1753	
		600V AC	3…10	194R-J30-1753	
			15…25	194R-J60-1753	
			30…50	194R-J100-1753	
			60…100	194R-J200-1753	
			125…150	194R-J400-1753	
Operator handle	–	208V AC	1…15	194R-PB	
		480V AC	1…25	194R-PB	
			30…200	194R-HM4	
		600V AC	3…25	194R-PB	
			30…150	194R-HM4	
Operator shaft	–	208V AC	1…10	194R-S2	
			15	194R-R4	
		480V AC	1…25	194R-S2	
			30…100	194R-R4	
			125…200	194R-R6	
		600V AC	1…25	194R-S2	
			30…100	194R-R4	
			125…150	194R-R6	

Table 22 - Main Input Disconnect Package Replacement Parts (style A) (Continued)

Description	Designation	Voltage	Hp	Part No.	Manufacturer
Main fuses	FU1…FU3	208V AC	1	10 Amp Class J	–
			2	15 Amp Class J	–
			3…5	20 Amp Class J	–
			7.5	35 Amp Class J	–
			10	40 Amp Class J	–
			15	80 Amp Class J	–
		480V AC	1	6 Amp Class J	–
			2…3	10 Amp Class J	–
			5	15 Amp Class J	–
			7.5…10	20 Amp Class J	–
			15…20	35 Amp Class J	–
			25	60 Amp Class J	–
			30	70 Amp Class J	–
			40	80 Amp Class J	–
			50	100 Amp Class J	–
			60	150 Amp Class J	–
			75	175 Amp Class J	–
			100	200 Amp Class J	–
			125	250 Amp Class J	–
			150	350 Amp Class J	–
			200	400 Amp Class J	–
		600V AC	3	10 Amp Class J	–
			5	15 Amp Class J	–
			7.5…10	20 Amp Class J	–
			15…20	35 Amp Class J	–
			25	60 Amp Class J	–
			30	70 Amp Class J	–
			40	80 Amp Class J	–
			50	100 Amp Class J	–
			60	150 Amp Class J	–
			75	175 Amp Class J	–
			100	200 Amp Class J	–
			125	250 Amp Class J	–
			150	350 Amp Class J	–

Table 22 - Main Input Disconnect Package Replacement Parts (style A) (Continued)

Description	Designation	Voltage	Hp	Part No.	Manufacturer
Drive module	DM1	208V AC	1	20AB4P2A0AYNANC0	Allen-Bradley
			2	20AB6P8A0AYNANC0	
			3	20AB9P6A0AYNANC0	
			5	20AB015A0AYNANC0	
			7.5	20AB022A0AYNANC0	
			10	20AB028A0AYNANC0	
			15	20AB042A0AYNANC0	
		480V AC	1	20AD2P1A0AYNANC0	
			2	20AD3P4A0AYNANC0	
			3	20AD5P0A0AYNANC0	
			5	20AD8P0A0AYNANC0	
			7.5	20AD011A0AYNANC0	
			10	20AD014A0AYNANC0	
			15	20AD022A0AYNANC0	
			20	20AD027A0AYNANC0	
			25	20AD034A0AYNANC0	
			30	20AD040A0AYNANC0	
			40	20AD052A0AYNANC0	
			50	20AD065A0AYNANC0	
			60	20BD077A0ANNANA0	
			75	20BD096A0ANNANA0	
			100	20BD125A0ANNANA0	
			125	20BD156A0ANNANA0	
			150	20BD180A0ANNANA0	
			200	20BD248A0ANNANA0	

Table 22 - Main Input Disconnect Package Replacement Parts (style A) (Continued)

Description	Designation	Voltage	Hp	Part No.	Manufacturer
Drive module	DM1	600V AC	3	20AE3P9A0AYNNNC0	Allen-Bradley
			5	20AE6P1A0AYNNNC0	
			7.5	20AE9P0A0AYNNNC0	
			10	20AE011A0AYNNNC0	
			15	20AE017A0AYNNNC0	
			20	20AE022A0AYNNNC0	
			25	20BE027A0AYNANA0	
			30	20BE032A0AYNANA0	
			40	20BE041A0AYNANA0	
			50	20BE052A0AYNANA0	
			60	20BE062A0AYNANA0	
			75	20BE077A0AYNANA0	
			100	20BE099A0AYNANA0	
			125	20BE125A0AYNANA0	
			150	20BE144A0AYNANA0	

Three-contactor Full-feature Bypass with Disconnect Package (style B)

Table 23 provides a list of replacement part numbers for the 3-contactor full-feature bypass with disconnect package (style B).

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Disconnect switch	DSI	208V AC	1…5	194R-J30-1753	Allen-Bradley
			7.5…10	194R-J60-1753	
			15	194R-J100-1753	
		480V AC	1…10	194R-J30-1753	
			15…25	194R-J60-1753	
			30…50	194R-J100-1753	
			60…100	194R-J200-1753	
			125…150	194R-J400-1753	
		600V AC	3…10	194R-J30-1753	
			15…25	194R-J60-1753	
			30…50	194R-J100-1753	
			60…100	194R-J200-1753	
			125…150	194R-J400-1753	
Operator handle	–	208V AC	1…15	194R-PB	
		480V AC	1…25	194R-PB	
			30…150	194R-HM4	
		600V AC	3…25	194R-PB	
			30…150	194R-HM4	
Operator shaft	–	208V AC	1…10	194R-S2	
			15	194R-R4	
		480V AC	1…25	194R-S2	
			30…100	194R-R4	
			125…150	194R-R6	
		600V AC	3…25	194R-S2	
			30…100	194R-R4	
			125…150	194R-R6	

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Main fuses	FU1…FU3	208V AC	1	10 Amp Class J	–
			2	15 Amp Class J	–
			3…5	20 Amp Class J	–
			7.5	35 Amp Class J	–
			10	40 Amp Class J	–
			15	80 Amp Class J	–
		480V AC	1	6 Amp Class J	–
			2…3	10 Amp Class J	–
			5	15 Amp Class J	–
			15…20	35 Amp Class J	–
			25	60 Amp Class J	–
			30	70 Amp Class J	–
			40	80 Amp Class J	–
			50	100 Amp Class J	–
			60	150 Amp Class J	–
			75	175 Amp Class J	–
			100	200 Amp Class J	–
			125	250 Amp Class J	–
			150	350 Amp Class J	–
		600V AC	3	10 Amp Class J	–
			5	15 Amp Class J	–
			7.5…10	20 Amp Class J	–
			15…20	35 Amp Class J	–
			25	60 Amp Class J	–
			30	70 Amp Class J	–
			40	80 Amp Class J	–
			50	100 Amp Class J	–
			60	150 Amp Class J	–
			75	175 Amp Class J	–
			100	200 Amp Class J	–
			125	250 Amp Class J	–
			150	350 Amp Class J	–

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Control transformer	T1	208V AC	1…10	TB-69300	ACME
			15	TB-69301	
		480V AC	1…20	TB-69300	
			25…60	TB-69301	
			75…150	TB-69302	
		600V AC	3…20	TB-81001	
			25…60	TB-81001	
			75…150	TB-81002	
Control transformer fuses	FU4, FU5	208V AC	1…10	1 Amp Class CC	–
			15	2 Amp Class CC	–
		480V AC	1…60	1 Amp Class CC	–
			75…150	2 Amp Class CC	–
		600V AC	3…60	1 Amp Class CC	–
			75…150	2 Amp Class CC	–
Bypass contactor	BC	208V AC	1…3	100-C16D10	Allen-Bradley
			5	100-C23D10	
			7.5…10	100-C37D00	
			15	100-C60D00	
		480V AC	1…10	100-C16D10	
			15…20	100-C37D10	
			25…30	100-C43D00	
			40	100-C60D00	
			50	100-C72D00	
			60	100-C85D00	
			75	100-D115ED11	
			100	100-D140ED11	
			125	100-D180ED11	
			150	100-D210ED11	
		600V AC	3…10	100-C16D10	
			15	100-C23D10	
			20	100-C30D10	
			25…30	100-C43D00	
			40	100-C60D00	
			50	100-C72D00	
			60	100-C85D00	
			75…100	100-D115ED11	
			125	100-D140ED11	
			150	100-D210ED11	

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Drive input contactor	DIC	208V AC	1…5	100-C16D10	Allen-Bradley
			7.5	100-C23D10	
			10	100-C37D00	
			15	100-C60D00	
		480V AC	1…10	100-C16D10	
			15…20	100-C23D10	
			25…30	100-C43D00	
			40	100-C60D00	
			50	100-C72D00	
			60	100-C85D00	
			75…100	100-D115ED11	
			125	100-D140ED11	
			150	100-D210ED11	
		600V AC	3…10	100-C16D10	
			15	100-C23D10	
			20	100-C30D10	
			25…30	100-C43D00	
			40	100-C60D00	
			50	100-C72D00	
			60	100-C85D00	
			75…100	100-D115ED11	
			125	100-D140ED11	
			150	100-D210ED11	

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Drive output contactor	DOC	208V AC	1…7.5	100-C16D10	Allen-Bradley
			10	100-C37D00	
			15	100-C60D00	
		480V AC	1…20	100-C16D10	
			25…30	100-C37D00	
			40	100-C43D00	
			50…60	100-C72D00	
			75	100-C85D00	
			100…125	100-D115ED11	
			150	100-D140ED11	
		600V AC	3…20	100-C16D10	
			25…30	100-C37D00	
			40	100-C43D00	
			50…60	100-C72D00	
			75	100-C85D00	
			100…125	100-D115ED11	
			150	100-D140ED11	
Overload relay	OL	208V AC	1…3	193-EEDB	
			5	193-EEEB	
			7.5	193-EEED	
			10	193-EEFD	
			15	193-EEGE	
		480V AC	1…2	193-EECB	
			3…7.5	193-EEDB	
			10	193-EEEB	
			15	193-EEED	
			20…30	193-EEFD	
			40…60	193-EEGE	
			75	193-EEVF	
			100	193-EEHF	
			125	193-EEJF	
			150	193-EEJG	

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Overload relay	OL	600V AC	3…10	193-EEDB	Allen-Bradley
			15	193-EEEB	
			20	193-EEED	
			25…30	193-EEFD	
			40…60	193-EEGE	
			75…100	193-EEVF	
			125	193-EEHF	
			150	193-EEJG	
Bypass control panel	CP1	208V AC	1…15	SK-C1-BCP1	
		480V AC	1…150	SK-C1-BCP1	
		600V AC	3…150	SK-C1-BCP1	
Power terminal blocks	T1…T3	208V AC	1…7.5	1492-W10	
			10…15	1492-W16S	
		480V AC	1…15	1492-W10	
			20…30	1492-W16S	
			40…75	1492-J35	
			100	67013	Mersen
			125…150	67003	
		600V AC	3…15	1492-W10	Allen-Bradley
			20…30	1492-W16S	
			40…75	1492-J35	
			100	67013	Mersen
			125…150	67003	
Control terminal blocks	T31…T40	208V AC	1…15	1492-W4	Allen-Bradley
		480V AC	1…150	1492-W4	
		600V AC	3…150	1492-W4	

Table 23 - Three-contactor Full-feature Bypass with Disconnect Package Replacement Parts (style B) (Continued)

Description	Designation	Voltage	Hp	Part Number	Manufacturer
Drive module	DM1	208V AC	1	20AB4P2A0AYNANC0	Allen-Bradley
			2	20AB6P8A0AYNANC0	
			3	20AB9P6A0AYNANC0	
			5	20AB015A0AYNANC0	
			7.5	20AB022A0AYNANC0	
			10	20AB028A0AYNANC0	
			15	20AB042A0AYNANC0	
		480V AC	1	20AD2P1A0AYNANC0	
			2	20AD3P4A0AYNANC0	
			3	20AD5P0A0AYNANC0	
			5	20AD8P0A0AYNANC0	
			7.5	20AD011A0AYNANC0	
			10	20AD014A0AYNANC0	
			15	20AD022A0AYNANC0	
			20	20AD027A0AYNANC0	
			25	20AD034A0AYNANC0	
			30	20AD040A0AYNANC0	
			40	20AD052A0AYNANC0	
			50	20AD065A0AYNANC0	
			60	20BD077A0ANNANA0	
			75	20BD096A0ANNANA0	
			100	20BD125A0ANNANA0	
			125	20BD156A0ANNANA0	
			150	20BD180A0ANNANA0	
Drive module	DM1	600V AC	3	20AE3P9A0AYNNNC0	
			5	20AE6P1A0AYNNNC0	
			7.5	20AE9P0A0AYNNNC0	
			10	20AE011A0AYNNNC0	
			15	20AE017A0AYNNNC0	
			20	20AE022A0AYNNNC0	
			25	20BE027A0AYNANA0	
			30	20BE032A0AYNANA0	
			40	20BE041A0AYNANA0	
			50	20BE052A0AYNANA0	
			60	20BE062A0ANNANA0	
			75	20BE077A0ANNANA0	
			100	20BE099A0ANNANA0	
			125	20BE125A0ANNANA0	
			150	20BE144A0ANNANA0	

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Publication 21VW-IN001D-EN-P - July 2013
Supersedes Publication 21VW-IN001C-EN-P - May 2007

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